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24 June 2004

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Subj: DRAFT FINAL REMEDIAL INVESTIGATION ADDENDUM REPORT, TAYLOR BOULEVARD BRIDGE (SITE 30), NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD, CONCORD, CALIFORNIA

Encl: (1) Draft Final Remedial Investigation Addendum Report for the Taylor Boulevard Bridge (Site 30), Naval Weapons Station Seal Beach, Detachment Concord, Concord, CA (24 June 2004)

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CONTRACT NUMBER N68711-00-D-0005



# Remedial Investigation Addendum Report for the Taylor Boulevard Bridge (Site 30)

Naval Weapons Station Seal Beach Detachment Concord Concord, California

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### **DRAFT FINAL**

June 24, 2004





AECRU Contract No. N68711-00-D-0005 Delivery Order No. 0045

# Remedial Investigation Addendum Report for the Taylor Boulevard Bridge (Site 30)

Naval Weapons Station Seal Beach, Detachment Concord Concord, California

June 24, 2004

#### Prepared for



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#### **ACRONYMS AND ABBREVIATIONS**

μg/L Micrograms per liter

Army U.S. Department of the Army AWQC Ambient water quality criteria

Bay San Francisco Bay

BERA Baseline ecological risk assessment

bgs Below ground surface

BNSF Burlington Northern Santa Fe Railroad Company

CAS Columbia Analytical Service

CERCLA Comprehensive Environmental Response, Compensation and Liability Act

COEC Chemical of ecological concern COPC Chemical of potential concern

DB Debris boring

EE/CA Engineering Evaluation/Cost Analysis

ERA Ecological risk assessment

ER-L Effects-range low ER-M Effects-range median

EPA U.S. Environmental Protection Agency

FS Feasibility study FSP Field sampling plan

GW Groundwater

HHRA Human health risk assessment

L Liter

L/min Liter per minute

mg/kg Milligrams per kilogram mg/L Milligrams per liter msl Mean sea level

Navy U.S. Department of the Navy NCP National Contingency Plan

NWS SBD Naval Weapons Station Seal Beach Detachment

OD Outer diameter

#### **ACRONYMS AND ABBREVIATIONS (Continued)**

PAS Pacific Aerial Survey PCB Polychlorinated biphenyl

pH Potential hydrogen

PRC PRC Environmental Management, Inc.

PRG Preliminary remediation goal PRRL Project-required reporting limit

PVC Polyvinyl chloride QA Quality assurance QC Quality control

RI Remedial investigation RPD Relative percent difference

RWQCB California Regional Water Quality Control Board

SAP Sampling and analysis plan

SB Sediment boring

Site 30 Taylor Boulevard Bridge Disposal Site

SOP Standard operating procedure SVOC Semivolatile organic compound

TCE Trichloroethene

TCRA Time-critical removal action

TEQ Toxic equivalency
Tetra Tech Tetra Tech EM Inc.
TOC Total organic carbon

TPH Total petroleum hydrocarbons

TPH-d TPH as diesel
TPH-g TPH as gasoline
TPH-mo TPH as motor oil
TSS Total suspended solids

VOC Volatile organic compound

WP Work plan

WP/FSP Work plan/field sampling plan

#### **EXECUTIVE SUMMARY**

The U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Engineering Field Activity West, directed Tetra Tech EM Inc. (Tetra Tech) to conduct a groundwater and sediment sampling investigation at the Taylor Boulevard Bridge Disposal Site (Site 30) (Figure 1) at Naval Weapons Station Seal Beach Detachment Concord, Concord, California. This report summarizes the results of the sampling effort.

The purpose of the 2003 Site 30 investigation was to (1) characterize groundwater quality, (2) assess the vertical extent of debris, and (3) characterize the concentrations of inorganic and organic chemicals present in sediment beneath the debris. These additional data supplement the information compiled in the draft final remedial investigation (RI) report (Tetra Tech 2002).

Sampling was conducted in accordance with the sampling and analysis plan (SAP), which consisted of both the field sampling plan and the quality assurance project plan in an integrated format (Tetra Tech 2003). Three groundwater monitoring wells were installed according to SAP procedures to collect samples derived from the native sediments below the site debris. Groundwater samples were collected using low-flow-rate sampling methodology. Groundwater level measurements were recorded in November 2003 at the beginning of the wet season and then again in February 2004 at the end of the wet season. The vertical extent of the debris was examined by hand-augering to the sediment below the debris. Samples of the underlying sediment were collected from each boring for analysis.

Arsenic, cadmium, copper, lead, selenium, and zinc were detected in sediment beneath the debris at concentrations above benchmark screening values (Table 4 and Figure 9). Concentrations of metals were highest on the peninsula in areas where the debris extends into the groundwater. At location SB201, on the tip of the peninsula, concentrations of copper, lead, and zinc below the debris were detected above effects-range median values (4- to 5-foot depth interval). At location SB205, however, which is in the center of the site where debris does not intersect groundwater, concentrations beneath the debris were not elevated, which agrees with the findings of the RI (Tetra Tech 2002, Appendix H). The 2003 sampling investigation suggests that leaching from the debris to subsurface sediment may be occurring in low-lying areas of the site closest to the shoreline, where the debris is within the groundwater.

In 1998, surface sediment and water samples collected about 10 feet offshore from location SB201 by RWQCB staff did not contain elevated levels of metals (Tetra Tech 2002; Appendix H). However, arsenic was detected at a concentration of 120 milligrams per kilogram (mg/kg) in a sediment sample collected at RWQCB sampling location 4 (southeast of the peninsula) by the Water Board Staff in December 2001 (see Appendix H).

Low concentrations of dioxins and furans were detected in the one sediment sample that was analyzed for dioxins. A toxicity equivalence quotient (TEQ) of 0.00114 micrograms per kilogram was calculated for the sample by multiplying the concentrations of all toxic congeners by a toxicity equivalence factor (TEF). The TEQ expresses the toxic dioxins and furans as a concentration of the most toxic form of dioxin, 2,3,7,8-tetrachlorodinbenzo-p-dioxin

(2,3,7,8-TCDD). No screening criterion was available for dioxin, and no specific sources of dioxin, such as incineration, are known to have occurred at the site.

The Navy believes that that groundwater at the Tidal Area may be a suitable candidate for exemption from consideration as a potentially suitable municipal or domestic water supply on the basis of criteria (such as low well yields and high concentrations of total dissolved solids [TDS]) contained in State Water Resources Control Board [SWRCB] Resolution 88-63 and RWQCB Resolution 89-39. Therefore, the groundwater data were screened using the most conservative of the marine or freshwater chronic values from the California Toxics Rule (EPA 2000) and the EPA National Recommended Water Quality Criteria (EPA 2002a) and for mercury, the Bay basin plan water quality objectives for waters upstream of San Pablo Bay (RWQCB 1995). Aluminum, arsenic, copper, mercury, and nickel were detected at concentrations above groundwater screening criteria at one or more locations. No semivolatile organic compounds, pesticides, polychlorinated biphenyls, or dioxins were detected in any of the groundwater samples. With the exception of one low level of detection of trichloroethene, no volatile organic compounds were detected in groundwater.

Groundwater level measurements collected from three monitoring wells in November 2003 suggested that the potentiometric surface was nearly flat (gradient was less than 0.001). Water level elevations in the three monitoring wells were within 0.1 foot of each other (Figure 7). Groundwater elevations in February 2004 were more than 1.5 feet higher than the November 2003 elevations. The potentiometric surface for February 19, 2004, suggested that groundwater flowed to the west at a gradient of approximately 0.002 feet (Figure 7).

Although aluminum, arsenic, copper, mercury, and nickel were detected at concentrations above groundwater screening criteria, only arsenic and aluminum were notably elevated above their screening criteria. Aluminum is not expected to be a problem because the pH is relatively neutral. The highest concentration of arsenic (150 micrograms per liter [µg/L]) was detected from monitoring well GW01, which is upgradient of the debris field. The exact source of arsenic in monitoring well GW01 is unknown, however it is most likely related to the debris. The hydraulic gradient for the site is nearly flat, which along with the generally low hydraulic conductivities in the subsurface, suggests that the rate of groundwater flow across the site is very low. Therefore, potential groundwater transport of arsenic from the debris is not expected to result in elevated concentrations of arsenic at significant distances from the waste. Surface water transport could cause elevated arsenic concentrations in groundwater if groundwater near the debris was discharging to surface water and arsenic-containing surface water was then recharging the groundwater near well GW01. Well GW01 is about 40 feet from the primary debris area. Surface water samples collected by the SF Bay RWQCB do not suggest that arsenic has been released from groundwater at the site at concentrations that may be causing adverse ecological effects (Appendix H). Sediment in the vicinity of GW01 is included in the riskfootprint (see Figure 6).

The additional data obtained during the supplemental investigation support the conclusions of the RI (Tetra Tech 2002) that inorganic concentrations in the area of debris at Site 30 are sufficiently high that they present a potential risk to plants, benthic invertebrates, and aquatic birds as well as a significant risk to the salt marsh harvest mouse. In order to address the source of contamination, which is the waste, the Navy plans to pursue a non-time-critical removal action

(non-TCRA) for the site in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the EPA's implementing regulations in the National Contingency Plan (NCP). A non-TCRA is appropriate for a site where the source of contamination is well-defined, and will expedite cleanup and ultimate site close-out. In accordance with regulations and guidance, the Navy will initiate the non-TCRA process by preparing an engineering evaluation/cost analysis (EE/CA) to identify and evaluate removal action alternatives, and recommend an alternative for the action.

#### 1.0 INTRODUCTION

The U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Engineering Field Activity West, directed Tetra Tech EM Inc. (Tetra Tech) to conduct a groundwater and sediment sampling investigation at the Taylor Boulevard Bridge Disposal Site (Site 30) (Figure 1) at Naval Weapons Station Seal Beach Detachment (NWS SBD) Concord, Concord, California. This site characterization effort supplements the data documented in the Draft Final Remedial Investigation (RI) report (Tetra Tech 2002). Sampling was conducted in accordance with the sampling and analysis plan (SAP), which consisted of both the field sampling plan (FSP) and the quality assurance project plan in an integrated format (Tetra Tech 2003). This report summarizes the results of the sampling effort.

This report is organized as follows:

- Section 1.0, Introduction, summarizes the purpose of the investigation and the site description and history.
- Section 2.0, Sampling Procedures and Methods, discusses the sampling procedures and laboratory analysis for groundwater and sediment.
- Section 3.0, Sampling Results, describes the analytical results, and the quality of the data for groundwater and sediment
- Section 4.0, Conclusions and Recommendations, summarizes the conclusions and recommendations based on the analytical results.
- Section 5.0, References, lists the documents used to prepare this report.

Figures and tables are presented after Section 5.0. Appendices to this report are presented after the figures and tables. Appendix A contains photographs taken during the sampling effort. Appendix B provides the field notes taken during the investigation. Appendix C contains the monitoring well completion records for the three groundwater monitoring wells installed during the investigation. Appendix D contains the monitoring well sampling sheets completed during well purging and sampling. Appendix E provides the chain-of-custody records for samples collected during this effort. Appendix F contains the borelogs describing the subsurface material at each borehole location. Appendix G provides all of the validated laboratory results for the 2003 Site 30 investigation. Appendix H contains sediment sampling results from previous investigations, including data collected by the San Francisco Bay Regional Water Quality Control Board (RWQCB). Appendix I presents the Navy's responses to agency comments on the draft report.

#### 1.1 PURPOSE OF THE INVESTIGATION

Regulatory comments received from the U.S. Environmental Protection Agency (EPA) and the RWQCB on the draft and draft final RI stated that groundwater data were required to fully characterize Site 30 (EPA 2001, 2002; RWQCB 2001, 2002). The purpose of the 2003 Site 30 supplemental investigation was to (1) characterize groundwater quality, (2) assess the vertical

extent of debris, and (3) characterize the concentrations of inorganic and organic chemicals present in sediment beneath the debris. These additional data supplement the information compiled in the draft final RI report (Tetra Tech 2002).

Three monitoring wells were installed, and groundwater samples were collected to evaluate whether site-related chemicals have migrated to groundwater and adversely affected groundwater quality. Groundwater samples were collected using low-flow purge methods and analyzed for total metals, hexavalent chromium, pesticides, polychlorinated biphenyls (PCB), volatile organic compounds (VOC), semivolatile organic compounds (SVOC), total petroleum hydrocarbons (TPH), total organic carbon (TOC), total suspended solids (TSS) and pH. In addition, one groundwater sample was analyzed for dioxins.

The vertical extent of the debris was characterized by hand-augering five borings to the sediment just below the debris. Samples of the underlying sediment were collected from each boring for analysis. These sediment samples were analyzed for metals, hexavalent chromium, pesticides, PCBs, SVOCs, TPH, pH, and TOC. In addition, one sediment sample was analyzed for dioxins.

#### 1.2 SITE DESCRIPTION AND HISTORY

NWS SBD Concord is located in the north-central portion of Contra Costa County, California, about 30 miles northeast of San Francisco (Figure 1). NWS SBD Concord is a federally owned facility and is currently operated and maintained by the Navy. The primary function of the facility is explosive ordnance transshipment. The facility encompasses about 13,000 acres and is bounded by Suisun Bay to the north and the City of Concord to the south and west (Figure 1). Currently, the facility includes two principal areas: the Tidal Area and the Inland Area. The Tidal Area encompasses about 6,800 acres, the majority of which is wetlands. The U.S. Department of the Army (Army) currently controls Tidal Area operations. Site 30 is located in the Tidal Area, beneath Taylor Boulevard Bridge. Taylor Boulevard is the main access road to the Tidal Area (Figures 1 and 2).

Access to Site 30 is through a guarded gate off Port Chicago Highway, west of the main entrance to the Inland Area. Public access is restricted.

Site 30, a triangular-shaped area of less than 1 acre, is located beneath the Taylor Boulevard Bridge. Site 30 is bordered by wetlands to the south and west (Figure 2) and is adjacent to Seal Creek Marsh. Vegetation includes wetland and wetland/upland species. Site 30 has no paved areas, no buildings are present, and no physical evidence exists of any previous construction at the site. The nearest improvements are the Taylor Boulevard Bridge and the Taylor Boulevard Railroad Bridge, which span the eastern side of the site. The elevation at the center of the site is 6 feet higher than the surrounding marsh. No portion of the site is higher than 12 feet above mean sea level (msl). The Santa Fe Railroad tracks are immediately south of the site and Waterfront Road, and the Southern Pacific Railroad tracks are immediately north of the site (Figure 2).

Debris consisting of broken glass, burned metal, and partially burned wooden railroad ties litter the ground surface at much of the site. Glass and metal debris are found at ground surface over a triangular area extending into the open water and onto a peninsula (Figure 3). Surface vegetation covers the debris in most areas.

#### 1.2.1 Site History

The region encompassing NWS SBD Concord was originally identified as Bay Point. The Tidal Area was originally occupied by the Pacific Coast Shipbuilding Company. The shipyard occupied the coastal area north of Site 30. A historical metal smelting operation was located on Seal Bluff immediately north of the Tidal Area before the Pacific Coast Shipbuilding Company occupied the site. Johnson Road was the only major road into the Tidal Area. In 1927, the Navy chose the site for naval ordnance operations because of its remote location and the availability of three major rail lines. Two of these rail lines bound the Site 30 to the north and south (Figure 2). The rail lines were reportedly constructed before 1940. Construction of the waterfront handling facilities began in January 1942, and in April 1942, the facility was commissioned as the Naval Magazine Port Chicago. Around this time, the name Bay Point was changed to Port Chicago. The Inland Area, located in the Diablo Creek Valley, was subsequently acquired and linked to the Tidal Area by the Port Chicago and Clayton Railroads. In 1963, the base was officially renamed Naval Weapons Station Concord. In April 1998, the base became the Naval Weapons Station Seal Beach, Detachment Concord.

NWS SBD Concord was the major naval, explosive ordnance transshipment facility on the West Coast. The facility provided storage, maintenance, and technical support for ordnance operations. In 1999, the facility went into a reduced operating status ("mothballed). The daily operation of the facility is being transferred to the Army; however, responsibility for environmental cleanup will remain with the Navy into the near future. No plans currently exist for base closure.

Seven aerial photographs taken by Pacific Aerial Surveys (PAS) between 1952 and 1984 (PAS 1952, 1959, 1974, and 1984) and observations made during recent site visits (PRC Environmental Management, Inc. [PRC] 1996) suggest that Site 30 has not been graded for more than 45 years. Slight changes in the site can be seen in each of the photographs, but there is no evidence of grading. The Taylor Boulevard Bridge and the railroad bridge (immediately east of Site 30) were constructed sometime between 1939 and 1950 (Figure 3). Changes in vegetation over time are apparent on the photographs, but these changes may be seasonal. The most notable change over time is the variation in the degree of inundation of Seal Creek Marsh. Although Seal Creek Marsh is readily identified as a marsh in the aerial photographs, the degree of site inundation varies significantly, probably with rainfall patterns. For example, marsh flooding is not apparent in photographs taken before August 6, 1996 (PAS 1952, 1959, 1974, 1984), but Seal Creek Marsh is inundated in the August 6, 1996, photographs (PRC 1996).

The dates of debris disposal and the source of the debris at the site are unknown. The debris includes blue-colored glass bottles and ceramic fragments, suggesting that the waste is perhaps 40 to 65 years old or older.

#### 1.2.2 Geology and Topography

The Tidal Area of NWS SBD Concord, which includes Site 30, is characterized by artificial fill material that overlies fine-grained Bay Mud sediments in elevated areas. In some areas, surficial materials were naturally deposited, and no filling has occurred. Artificial fill material was used in the Tidal Area to construct road and railroad beds, channel levees, structural pads, and protective revetments. The fill material was used to elevate portions of the base above the marsh plane, which is generally 1 to 2 feet above msl in the Tidal Area.

#### 1.2.3 Hydrogeology

Regional and local hydrologic and hydrogeologic environments of the Tidal Area at NWS SBD Concord are presented in this section. Hydrologic data stem from various surface and subsurface field investigations. Hydrogeologic data are based on geologic maps, data from subsurface field investigations in the Suisun Bay and Carquinez Strait area, and published materials (Tetra Tech 2002).

The Tidal Area is characterized by a highly irregular piezometric surface and very thin (or absent) vadose zone. Surface water features in the Tidal Area act to recharge local groundwater zones or as a point of groundwater discharge. Groundwater from the surrounding hills flows northward toward Suisun Bay and discharges to surface waters in the Tidal Area. Surface water from the surrounding hills flows northward toward Suisun Bay in creeks and artificial ditches, canals, and culverts.

Groundwater at the Tidal Area occurs in a shallow, unconfined water-bearing zone composed of silty clays. As NWS SBD Concord grew, site drainage was modified through adding drainage channels and filling both natural and manmade channels with sandy fill materials and silty clays. The result is a complex subsurface characterized by silty clays and linear bodies of sandy fill material.

Tidally influenced sloughs in the lowlands near Suisun Bay route bay water to and from the Tidal Area. Hastings Slough in the western portion of the Tidal Area extends from Suisun Bay to the Tosco Avon Refinery in Martinez, California. Mount Diablo Creek (called Seal Creek by NWS SBD Concord) drains into Hastings Slough. Although Seal Creek and Hastings Slough are tidally influenced sloughs adjacent to Site 30, significant tidal fluctuation does not extend into Seal Creek Marsh. Based on repeated field observations, water levels at Site 30 fluctuate less than 6 inches during daily tidal cycles.

In the Tidal Area, groundwater is generally a few feet below ground surface throughout the year. Groundwater elevations at the Site 30 are less than 1 foot below ground surface (bgs) at the margin of Seal Creek Marsh.

Four major hydrogeologic units were identified beneath the Tidal Area within 100 feet of the surface. The four units were (1) bay sediments (clay with sand and peat stringers), (2) Yerba Buena mud (clay with minor sand lenses), (3) recent alluvium (including sands, silts, and clays), and (4) fluvial or estuarine sediments (predominantly micaceous sand). In addition, artificial fill is present in the upper surface at several locations in the Tidal Area, particularly at Site 30. The artificial fill at Site 30 consists of a combination of soil fill, old broken glass, metal scrap, and other debris. At Site 30, recent alluvium and bay sediments, consisting of silty clay, may be the only hydrogeologic units present. A description of the sediment and artificial composition, the relative thickness, and the distribution of each unit are contained in Section 3.3.2 of the RI (Tetra Tech 2002).

#### 1.2.4 Summary of Previous Investigations

Previous investigations are summarized in the following section.

#### Initial Investigations (1996 through 1998)

Site 30 was identified in late 1995 during an RI conducted at four nearby Tidal Area sites. The Navy collected sediment samples from Site 30 borings and the surrounding area in February 1996, March 1997, October 1997, February 1998, and June 1998. These investigations served to characterize the site's soil and sediment chemistry and assess the nature and extent of chemicals likely to originate from on-site debris. Additional sampling to address the baseline ecological risk assessment (BERA) data needs was conducted during February and March 2000. The BERA sampling included the collection of composite sediment samples for metals analysis and bioassays and the collection of pickleweed and amphipods for tissue residue analysis. In addition, 22 holes were dug throughout the site in an effort to characterize the depth and lateral extent of the site debris.

Figure 4 shows the sampling locations for the previous investigations. Sampling results for previous investigations are provided in Appendix H.

The initial sediment sampling investigation at Site 30 was conducted in February 1996. Sediment samples were collected from three borings (SB01 through SB03) in the central region of the site, where scattered glass, metal, and wood debris was present. All sampling locations are illustrated on Figure 4. Two sediment samples were collected from each of the borings: one from 0.0 to 0.5 foot bgs, and one from 2.0 to 2.5 feet bgs. Six sediment samples were collected and analyzed for SVOCs, metals, purgeable TPH (gasoline-range compounds), and extractable TPH (diesel fuel- and motor oil-range compounds). Samples were not analyzed for pesticides and PCBs because the large amount of glass debris at the site suggested a disposal area for household waste rather than industrial waste. Samples were also not analyzed for VOCs because they are not likely to be present in exposed surface sediment.

Analytical results for the initial six samples from borings SB01 through SB03 suggested that TPH as diesel (TPH-d) and TPH as motor oil (TPH-mo) were present at the surface at SB01 and SB03. TPH-d and TPH-mo were not detected at SB02 or in any of the deeper samples from 2.0 to 2.5 feet bgs. The highest concentrations of metals were detected in surface samples from

SB01 and SB03. Samples collected from 2.0 to 2.5 feet bgs contained lower concentrations of metals and SVOCs. Metals concentrations in the deeper samples appeared to be within the estimated ambient limit range.

Based on the results of the initial sampling, a second round of sampling was conducted in March 1997. Nine borings (SB04 through SB12) were completed primarily to the east and south of borings SB01 through SB03 (Figure 4) to evaluate the lateral extent of metals, TPH, and SVOC concentrations. The analytical data were also to be used in estimating the approximate volume of waste material. Samples were collected at each boring from the 0- to 0.5- and 1.0- to 1.5-foot bgs intervals. Although SVOCs and TPH were detected in the surface samples, the pattern of detected organic chemicals did not suggest a significant release because deeper sediments were not impacted. Consequently, SVOCs and TPH were not evaluated during subsequent sampling rounds.

Following the second round of sampling in March 1997, the vertical extent of site chemicals in sediment was considered to be delineated; however, the lateral extent of elevated metals concentrations in Site 30 sediment was not defined. Three additional rounds of sampling were conducted to evaluate the lateral extent of metals concentrations in surface sediment in the adjacent submerged region of Seal Creek Marsh. Surface sediment sampling events were conducted in October 1997 (including samples SB13 through SB20), March 1998 (including samples SB100 through SB106), and June 1998 (including samples SS200 through SS214). Sampling in the final two rounds extended laterally into areas where the concentrations of metals in sediment samples were lower.

Based on preliminary evaluations of the spatial distribution of chemicals in sediments, it was clear that a removal action would be necessary to reduce the potential risk to human health and the environment. Preliminary evaluations suggested that concentrations of inorganic chemicals (primarily lead) at the center of the site were higher than sediment concentrations detected in surrounding areas. The high concentrations of inorganic chemicals in sediment in the center of the site were considered to pose a potential risk to both human health and the environment. Based on the results of these preliminary evaluations, the Navy proposed a removal action to remove the debris to mitigate the risk to the environment. Based on discussions between the Navy and regulatory agencies, however, it was decided that an RI and feasibility study (FS) would be conducted for Site 30.

#### Remedial Investigations

In August 1999, a final report and summary work plan, summarized available data and presented a screening-level human health risk assessment (HHRA) and a screening-level ecological risk assessment (ERA) (Tetra Tech 1999). Although the site posed potential human health risks, threats to ecological receptors were determined to be the primary risk drivers at the site because of the presence of wetlands, the potential presence of special status species, and limited human access to the site. The site remediation necessary to mitigate the risk to animal receptors would also be expected to mitigate the risk to humans, even under the application of extremely conservative assumptions regarding human contact with the site. Based on the conclusions of the screening level ERA, a BERA was recommended. Field activities in the summary report and WP/FSP were, therefore, designed to complete the data requirements of a BERA.

Additional sampling to address the data needs for a BERA was conducted during February and March 2000. The BERA samples included three composite sediment samples analyzed for total metals and for amphipod toxicity. Three collocated sediment and pickleweed and three collocated sediment and amphipod tissue samples were also collected for the BERA investigation. The BERA sampling included collection of composite sediment samples for metals analysis and bioassays and collection of pickleweed and amphipods for tissue residue analysis.

Also during the BERA sampling, 22 holes were dug throughout the site to characterize the depth and lateral extent of the site debris. These debris test hole locations are identified by triangular symbols on Figure 4 and are numbered DB001 through DB022. Figure 5 shows profiles of the debris test holes; soil types and the vertical extent of the debris are illustrated. The results were presented in the draft Final RI (Tetra Tech 2002).

#### Summary of Conclusions Presented in the Draft Final Remedial Investigation Report

The following subsections summarize the conclusions of the February and March 2000 investigations conducted for the Site 30 RI. The extent of the site debris was delineated and risk footprints were identified based on the screening level HHRA and BERA. The risk footprint encompasses the risk to both human and ecological receptors by location (Figure 6).

#### **Human Health Risk Assessment Summary**

The screening-level HHRA conducted for Site 30 suggested that chemicals of potential concern (COPC) are currently present at levels that could result in adverse health effects for residents. COPCs are present at higher concentrations at the center of the site within the risk footprint (Figure 6). If remediation were conducted to remove elevated concentrations of inorganic compounds within the risk footprint, concentrations of COPCs in the remaining soil and sediment would be within EPA target levels considered to be protective of human health. Potential exposures to COPC concentrations found outside the risk footprint would not be expected to result in adverse health effects. Following remediation of soil and sediment within the risk footprint, the only COPCs remaining at concentrations above EPA Region IX residential Preliminary Remediation Goals would be arsenic and iron.

#### **Baseline Ecological Risk Assessment Summary**

Adequate information was available to evaluate the potential risk to receptors from chemicals at Site 30. The BERA evaluated the following receptors: wetland and upland transitional plants, benthic invertebrates, aquatic birds (represented by the Black-necked stilt and Mallard), and small mammals (represented by the salt marsh harvest mouse). One of the primary objectives of the BERA was to establish a risk footprint to establish the boundary for potential remedial action.

The current level of inorganic chemical contamination at the site poses probable risk to plant, invertebrate, and bird and mammal receptors. In addition, the risk to the salt marsh harvest mouse, a threatened and endangered species, is significant. Areas with the highest levels of inorganic chemicals contamination are located where the debris is most concentrated, which is along the shoreline and in the center of the site. Removal of the debris would significantly reduce risk to both aquatic and wetland receptors.

Concentrations of some inorganic chemicals of ecological concern (COEC) at the site are very high, based on comparison with background and with available screening values. COECs that pose a risk to one or more of the assessment endpoint receptors at the Site 30 include arsenic, cadmium, copper, lead, mercury, selenium, and zinc. Copper and zinc are COECs to all receptors, while mercury is only a COEC to aquatic birds and the salt marsh harvest mouse. Lead is a COEC to all receptors except plants. Cadmium is only a COEC to aquatic birds.

#### **Extent of Debris**

The peninsula section of the site contains the greatest amount of debris (Figure 5). The debris along the peninsula consisted primarily of glass fragments, intact glass bottles, and what appeared to be highly rusted metal debris (rust flakes and fragments). The rusted material was essentially mixed with the small amount of sediment that composed the debris matrix on the peninsula. No intact metal containers or pieces of metal resembling containers were recovered in the peninsula debris test holes. The debris in the peninsula area extends to greater than 3.0 feet bgs. Debris test holes on the peninsula could not be dug deeper than about 3 to 3.5 feet bgs because of difficulty in digging into debris at depth and extracting it through flooded holes.

The extent of debris in the aquatic portion of the site was estimated by probing the submerged sediments of the offshore area with a shovel and a 5-foot length of plastic pipe. Using this probing method, debris (particularly glass fragments) could be "felt" to assess its offshore extent. Debris appears to extend about 10 to 20 feet offshore (Figures 5 and 6). This debris appears to extend down 1 to 2 feet below the sediment surface. In the area south of the peninsula, about 6 inches of sediment covers the debris. The debris appears to be heaviest close to the shoreline and is mixed with sediment in most areas.

#### Sampling Conducted by the San Francisco Bay Regional Water Quality Control Board

The RWQCB collected seven surface water samples in the Seal Creek Marsh, directly offshore from Site 30, in December 2001. The samples were analyzed for total and dissolved metals and screened against freshwater continuous concentration criteria based on hardness from EPA State California Water Quality Criteria (California Toxics Rule) (EPA 2000; RWQCB 1995). Chromium (total) was detected at one location, and zinc (dissolved) was detected at several locations. Concentrations for both total and dissolved metals were, however, well below the ambient water quality control values calculated based on a hardness of 400 milligrams per liter (mg/L). The RWQCB also collected four surface sediment samples; these samples were analyzed for total metals. Lead and copper were detected above screening values at one location (490 milligrams [mg] per kilogram [kg] and 97 mg/kg, respectively). Arsenic was detected in a sediment sample collected at RWQCB's sampling location 4 southeast of the peninsula at a concentration above EPA's preliminary remediation goal (PRG) cancer risk endpoint (EPA 2002c) of 29 parts per million (ppm).

Lead and copper were not detected in surface water samples collected from this location. No sediment screening values were exceeded at the other three sediment sampling locations.

#### 2.0 SAMPLING PROCEDURES AND METHODS

This section discusses supplemental sampling of groundwater and sediment at Site 30. Subsections include descriptions of monitoring well installation (Section 2.1), groundwater sampling (Section 2.2), and completion of debris core and sediment sampling (Section 2.3). Appendix A contains photographs of the 2003 Site 30 field activities.

#### 2.1 MONITORING WELL INSTALLATION AND DEVELOPMENT

At Site 30, three groundwater monitoring wells were installed according to procedures specified in the SAP (Tetra Tech 2003). The following paragraphs summarize those procedures. The wells were intended to collect samples of groundwater derived from the native sediments located just below the site debris.

In a variance to the procedures described in the SAP, the monitoring wells were completed using hand augers rather than a conventional hollow-stem auger drill rig. Hand augers were used because of limited site access. To access the site with a drill rig, it would have been necessary to drive over the Burlington Northern Santa Fe Railroad Company (BNSF) railroad tracks (Figure 2). The Navy pursued a temporary crossing permit with BNSF. BNSF denied the permit application for safety reasons because tracks were on a frequently used, main line. BNSF did, however, grant the Navy a temporary access permit, which allowed for crossing the tracks on foot.

Monitoring well borings were installed with 3-1/4-inch (outer diameter [OD]), steel, hand augers. Sediment from the hand auger bucket was collected continuously for lithologic logging as each boring was augered to its total depth. A lithologic description of each boring was prepared during well installation by the field geologist. The lithologic descriptions for each well boring are contained in the field notes (Appendix B).

The wells were constructed of 1-inch OD, schedule 40 polyvinyl chloride (PVC). Well screens were 10 feet long, 1-3/4-inch OD, schedule 40 PVC with 0.010-inch slot-size to allow suitable recharge in low-permeability formations and to allow seasonal water table fluctuations. At wells GW01 and GW02, the well screen intersects the water table, and the top of the well screen is set at least 2 feet above the water table. At well GW03, however, the well screen may only be 6 inches above the water table because of the shallow depth to groundwater at this location. The filter pack for each well consisted of RMC Pacific Lapis Lustre (brand) Monterey Sand, size #2/12. This sand is compatible with the 0.010-inch slot size screen and was installed by pouring from the surface through the interval from 1 foot above and to the bottom of the well screen (to 1 foot below the screen at well GW03). At each well, a 9- to 12-inch-thick seal of hydrated bentonite pellets was installed at the top of the filter pack. The 12-inch depth of the annular space from the top of the filter collar to the surface at well GW01 was filled with cementbentonite grout emplaced by pouring. The depth of the annular space at wells GW02 and GW03 was only 3 inches, and consequently was not sealed with grout. The surface completion for each well consists of a concrete pad and stove-pipe-type outer protective casing. The wells are secured with keyed-alike padlocks. Appendix C contains monitoring well completion records

for the three wells. Soil boring lithologies for the monitoring wells GW001, GW002, and GW003 are also provided in Appendix C.

The three newly installed monitoring wells were developed using a surge bailing and overpumping method in accordance with Tetra Tech Standard Operating Procedure (SOP) No. 21. This SOP is included as an appendix to the SAP (Tetra Tech 2003). The following paragraphs give a brief summary of the well development method used at Site 30.

All drilling methods impair the ability of an aquifer to transmit water to a drilled hole. This impairment is typically a result of disturbance of soil grains (smearing) or the invasion of drilling fluids or solids into the aquifer during the drilling process. The impact to the hydrologic unit surrounding the borehole must be remediated so that the well hydraulics and samples collected from the monitoring well are representative of the aquifer.

Well development was conducted as an integral step of monitoring well installation to remove the finer-grained material, typically clay and silt, from the geologic formation near the well screen and filter pack. The fine-grained particles may interfere with water quality analyses and alter the hydraulic characteristics of the filter pack and the hydraulic unit adjacent to the well screen. Well development improves the hydraulic connection between water in the well and water in the formation. The most common well development methods are surging, jetting, overpumping and bailing.

A combination of surge bailing and overpumping was used to develop the Site 30 wells. Because of the small diameter (13/16-inch inner diameter) disposable polyethylene bailers were used as surge blocks at each well. The bailers were only slightly smaller than the well casing diameter. At each well, a bailer was allowed to fall freely through the well casing until it struck the groundwater surface. The contact of the bailer produces a downward force and causes water to flow outward through the well screen, breaking up bridging that has developed around the screen. As the bailer fills and is rapidly withdrawn from the well, the drawdown created causes fine particles to flow through the well screen and into the well. Subsequent bailing removed these particles from the well. Lowering the bailer to the bottom of the well and using rapid short strokes to agitate and suspend solids that had settled to the well bottom enhanced removal of sand and fine particles.

Following the surge bailing technique, several well casing volumes of groundwater were pumped from each well, a development technique generally known as overpumping. Overpumping involves pumping the well at a rate substantially higher than it will be pumped during well purging and groundwater sampling. Overpumping at Site 30 was accomplished with a peristaltic pump and polyethylene tubing. The polyethylene tubing was lowered into the water column at a depth sufficient to ensure that the water in the well is not drawn down below the tubing intake. Overpumping induces a high velocity water flow, resulting in the flow of sand, silt and clay into the well, opening clogged screen slots and cleaning formation voids and fractures. The movement of these particles at high flow rates help eliminate particle movement at the lower flow rates used during well purging and sampling.

The following water quality parameters were monitored at the start of well development and continually during overpumping: pH, temperature, turbidity, and specific conductance.

Bailing and overpumping was continued until the water from each well was free of suspended particles and water quality parameters had stabilized to within 10 percent. Approximately 23 to 25 liters of water was removed from each well during well development.

#### 2.2 GROUNDWATER SAMPLING PROCEDURES AND METHODS

One round of groundwater samples were collected at the Site 30 wells in November 2003. All of the wells supported a recharge rate greater than 0.1 liter per minute, consequently, the low-flow purging and sampling technique described in Section 2.2.1.3 of the SAP (Tetra Tech 2003) was successfully used. A brief summary of the low-flow purging and sampling technique is provided in the following paragraphs. Appendix D contains the monitoring well sampling sheets showing the low-flow purging data collected for the Site 30 wells.

#### 2.2.1 Groundwater Sample Collection

Studies by EPA have shown that low flow-rate purging techniques can be used to obtain more accurate and representative groundwater samples for metals analyses than conventional sampling and filtering techniques (Puls and Powell 1992). A principle objective of low flow-rate purging is to avoid entraining silt- and clay-sized particles in groundwater samples by purging wells at low velocities. Low velocity purging is intended to establish direct flow from the aquifer to the sample container at velocities and flow conditions comparable to in situ flow velocities. By using low flow-rate purging techniques, the sampling process more closely matches natural groundwater flow conditions and transport of suspended solids, and analytical problems and uncertainties caused by turbidity are reduced. The field procedure for low flow-rate sampling at Site 30 is described as follows:

- 1. The breathing zone was monitored with a photoionization detector during removal of each well cap, and the reading was compared with the background reading for the site to select the appropriate level of personal protection. Results were below background.
- 2. The depth to water was measured with an electric-sounder water level meter to assess the equilibrium water level.
- 3. A polyethylene tube was gently lowered into each well to a depth of 3.5 feet below the equilibrium water level or 2 feet below the top of the well screen (whichever was greater) and secured to the outer well casing with tape or plastic ties.
- 4. Well purging was initiated slowly and increased gradually to a rate of approximately 0.15 liter per minute (L/min) using a peristaltic pump. Purge water stabilization parameters, including pH, temperature, electrical conductivity, dissolved oxygen, and turbidity, were measured at intervals of a minimum of 1 liter (L) and recorded on well sampling sheets (Appendix D). Purge water was discharged into a graduated cylinder, and the volume of water purged was also measured and recorded on well sampling sheets.

At this point in the procedure, for each of the three Site 30 wells, the water level drawdown was less than 0.3 foot at the established pumping rate, and the water level was stable. Consequently, the rate was increased to the maximum rate at which a static water level was obtained (up to 0.25 L/min), and procedures 5 and 6 were initiated.

5. The purge water was considered stabilized after the collection of a minimum of eight measurements (8 L purged) and three successive measurements of each of the stabilization parameters that fall within the following ranges:

pH:  $\pm 0.1$ 

Electrical conductivity:  $\pm 3$  percent microSiemens per centimeter

Temperature:  $\pm 0.5$  °C Dissolved oxygen:  $\pm 0.2$  mg/L

Turbidity:  $\pm$  15 percent relative percent difference or three successive

measurements of less than 15 nephelometric turbidity units

6. Well stabilization parameters were expected to asymptotically approach a constant value as the purge water began to stabilize. At each of the Site 30 wells, well stabilization parameters were within the ranges specified previously but still appeared to be approaching an asymptotic value. Consequently, well purging was continued until the purge water appeared to be at equilibrium or until a maximum of 20 L had been purged from the well.

The following procedures were followed in collecting groundwater samples from the monitoring wells after purging had been completed:

- 1. Measuring and sampling equipment were decontaminated before samples were collected from each location following the procedures outlined in the SAP (Tetra Tech 2003).
- 2. During sampling, well purging equipment was positioned so that potential sources of VOCs, such as vehicles, gasoline engines, or fuel tanks, were downwind of the location of the well.
- 3. Water samples were collected directly from the polyethylene tube discharge of the peristaltic pump.

Electric-sounder water level meters used during groundwater sampling activities were decontaminated before each use by washing the probe and the portion of the cable directly above the probe with distilled water and wiping those parts clean with a disposable paper towel. Because new polyethylene tubing was used at each well, decontamination of the tubing was not necessary.

Well development and purge water as well as decontamination fluids were placed in 55-gallon drums. The drums were stored at a designated investigation-derived waste area within the NWS SBD Concord Tidal Area. The drums were removed and disposed of properly in February 2004.

Additionally, quality control (QC) samples were collected in the field and analyzed to check sampling and analytical precision, accuracy, and representativeness of the data set. QC samples included one field duplicate, one equipment rinsate, one source water blank, and two trip blanks. Table 1 lists the analytical data for the QC samples, and Section 3.3 summarizes the results of these data.

#### 2.2.2 Groundwater Sample Laboratory Analyses

Groundwater samples were analyzed by Curtis and Tompkins, Ltd, of Berkeley, California, a state-certified laboratory. The sample collected for dioxin analysis (from well GW03) was sent to Columbia Analytical Services (CAS) in Houston, Texas. The Houston CAS laboratory specializes in dioxin analysis. In the draft final SAP (Tetra Tech 2003), only one groundwater sample was selected for analysis for dioxins based on several factors: (1) specific sources of dioxin such as incineration are not known to have occurred at Site 30; (2) the solubility of dioxins in water is very low; it thus tends to adhere to soil if released to land and is not likely to leach to groundwater; and (3) dioxins are ubiquitous in the environment.

Appendix E presents the chain-of-custody records that accompanied the samples collected from monitoring wells at Site 30 to the laboratories. Groundwater samples were analyzed using the analytical methods listed in the following table.

Analysis	Method
Metals	EPA 6010B, 7000 / SW-846
Hexavalent Chromium (CrVI)	EPA 7196A
PCBs	EPA 8081A / SW-846
Pesticides	EPA 8082 / SW-846
SVOCs	EPA 8270C / SW-846
VOCs	EPA 8260B / SW-846
TPH (diesel- and motor oil-range, and gasoline-range organics)	EPA 8015B / SW-846
TOC, pH (potential hydrogen), TSS	EPA SM5310B (TOC) EPA 9040B (pH) EPA 160.2 (TSS)
Dioxin (well GW03 only)	EPA 8280A / SW-846

#### 2.3 Debris Boring Completion and Sediment Sampling Procedures

Per the SAP, five locations were selected at Site 30 for debris borings (SB201 through SB205) (Figure 3) based on the results of the debris test holes evaluated in February 2000 (Figures 4 and 5). In February 2000, debris test holes on the Site 30 peninsula could not be dug deeper than about 3 to 3.5 feet bgs because of difficulty with digging and extracting debris through flooded holes. The five new locations selected for debris sampling in 2003

were near previous test pits at which the vertical extent of the debris was not characterized (Figures 4 and 5). The latest borings were advanced to the bottom of the debris to delineate the vertical extent of the debris on the peninsula (Figure 5). Additionally, for each boring, one sediment sample was collected below the debris to assess whether contaminants are leaching from the debris to subsurface sediment. A boring log was completed for each debris boring (Appendix F).

#### 2.3.1 Debris Boring and Sediment Sample Collection

The following subsections provide brief descriptions of the methods and procedures used to complete the debris borings and sample underlying sediment.

#### **Debris Boring Completion**

The locations of the five debris borings are shown on Figure 3. Because of the limited access of Site 30, hand augers were used to complete the debris borings. To keep the debris borings from collapsing, a length of 4-inch diameter PVC pipe was also used to complete each boring. At each debris boring location, the PVC pipe was hammered to approximately 1 foot below the ground surface, and then the sediment and debris inside the pipe was removed with a hand auger. The PVC pipe was hammered into the ground, and debris was removed in this fashion until the bottom of the debris deposit was found. The sediment underlying the debris was then sampled.

#### **Sediment Sample Collection**

Sediment samples were collected from the sediment 6 to 12 inches beneath the debris at each debris boring location. The sediment was lifted from each boring using a hand auger, placed on a stainless-steel tray and homogenized with a plastic scoop. Sediment samples were then collected in 8-ounce glass jars and sent to the analytical laboratories.

#### 2.3.2 Sediment Laboratory Analyses

In addition to the groundwater samples, sediment samples were also analyzed by the Curtis and Tompkins, Ltd., laboratory. The sediment sample collected from debris boring SB203 for dioxin analysis was sent to the specialized dioxin analyses laboratory (CAS Houston). Appendix E presents the chain-of-custody records that accompanied the sediment samples collected from Site 30 to the laboratories.

Sediment samples were analyzed using the analytical methods listed in the following table.

Analysis	Madhaal
Analysis	Method
Metals	EPA 6010B, 7000 / SW-846
PCBs	EPA 8081A / SW-846
Pesticides	EPA 8082 / SW-846
SVOCs	EPA 8270C / SW-846
TPH (diesel- and motor oil-range, and gasoline-range organics)	EPA 8015 / SW-846 and California Leaking Underground Fuel Tank Manual
Dioxins (SB203 only)	EPA 8280A / SW-846
TOC and pH	EPA 5310B (TOC) EPA 9045C

#### 3.0 SAMPLING RESULTS

This section describes the results of the groundwater level measurements (Section 3.1), groundwater sample analyses (Section 3.2), debris test hole observations and sediment sample results (Section 3.3), and data quality (Section 3.4) for samples collected during the 2003 additional RI work at Site 30.

#### 3.1 GROUNDWATER LEVELS

Groundwater level measurements of the three new monitoring wells were surveyed in November 2003 and February 2004. All survey measurements were taken within a 10-minute interval. Groundwater level measurements in November 2003 suggested that the potentiometric surface was nearly flat (gradient was less than 0.001). Water level elevations in the three monitoring wells were within 0.1 foot of each other (Figure 7). Groundwater elevations in February 2004 were more than 1.5 feet higher than the November 2003 elevations. The potentiometric surface for February 19 suggested that groundwater flow was directed to the west at a gradient of approximately 0.002 (Figure 7).

#### 3.2 GROUNDWATER SAMPLE RESULTS

This section summarizes the analytical results for the groundwater samples collected from the three Site 30 wells (GW01 through GW03). The groundwater samples were analyzed for total metals, PCBs, pesticides, SVOCs, VOCs, and TPH. The sample from well GW03 was also analyzed for dioxins. Additionally, the groundwater parameters pH, TSSs, and TOC were measured in each sample.

Section 3.2.1 describes the groundwater screening criteria used to identify chemicals of potential concern. Sections 3.2.2 and 3.2.3 contain an evaluation of the groundwater data analyte groups compared with groundwater screening criteria. Appendix G presents the complete validated analytical results.

#### 3.2.1 Groundwater Screening Criteria

Groundwater screening criteria selected for use at Site 30 are the same as those used for the Tidal Area and Litigation Area sites at NWS SBD Concord. These criteria were selected based on a series of discussions with RWQCB project managers and technical staff. For example, the San Francisco Bay (Bay) basin plan criterion for mercury (RWQCB 1995) was selected based on a request by RWQCB staff. The hardness conversions for selected metals were approved by RWQCB staff for use at the Litigation Area sites.

Table 3 presents analyte concentrations in Site 30 groundwater samples compared with ambient water quality criteria (AWQC) or Bay basin plan objectives. AWQCs are set forth by EPA under the Clean Water Act Section 304(a)(1) and described in the National Toxics Rule (EPA 2002a). AWQCs are intended to "accurately reflect the latest scientific knowledge" on the effects of these analytes on aquatic life. These criteria can provide guidance for determining acceptable conditions for both marine and freshwater aquatic life. California has adopted statewide water quality criteria for the protection of aquatic life, as described in the California Toxics Rule (EPA 2000). In addition, the Bay basin plan water quality objectives for waters upstream of San Pablo Bay identified screening values for the estuary, which are sometimes lower than the National or California AWQCs (RWQCB 1995).

In 1995, EPA amended the regulations to convert many of the metals criteria, which were previously based on total recoverable concentrations, to dissolved concentrations (EPA 1995a, 1995b). Groundwater samples collected for the Site 30 evaluation were analyzed for total recoverable concentrations of metals; however, data were compared to AWQC reported as dissolved concentrations, which is more conservative than AWQC based on total recoverable concentrations.

Salinities at the Tidal Area range from 0 to 57 parts per thousand (Western Ecological Services Company 1995); this range is influenced by tidal cycles and precipitation. As a result, both freshwater and marine criteria were considered applicable and relevant. Because of the brackish nature of the site, however, the lower of the freshwater or saltwater criteria was used as suggested in the Bay basin plan (RWQCB 1995).

The project-required reporting limit (PRRL) was used as the screening criterion for a subset of chemicals for which the screening value was less than the PRRL. The PRRL is the concentration the analytical laboratory can achieve based on the maximum sensitivity of the analytical method. Chemicals for which this was the case were identified in Appendix D of the SAP (Tetra Tech 2003) and on Table 3.

#### 3.2.2 Metals in Groundwater

Aluminum, arsenic, copper, mercury, and nickel were detected at concentrations above groundwater screening criteria at one or more locations (Table 3 and Figure 8). The results for each of these metals are discussed in the following text.

#### **Aluminum**

Aluminum concentrations exceeded the groundwater screening criterion (87  $\mu$ g/L) in samples from all three monitoring wells. The maximum concentration (1,100  $\mu$ g/L) was detected at monitoring well GW02. The concentration of aluminum detected in the duplicate sample collected at monitoring well GW02 was 560  $\mu$ g/L.

#### Arsenic

Arsenic exceeded the groundwater screening criterion (36  $\mu$ g/L) at all three monitoring wells. The maximum concentration (150  $\mu$ g/L) was detected at monitoring well GW01. Arsenic was also detected at 60  $\mu$ g/L at GW03 and 37  $\mu$ g/L at GW02.

#### Copper

Copper slightly exceeded the groundwater screening criterion (3.1  $\mu$ g/L) at monitoring wells GW02 and GW03. The maximum concentration (3.7  $\mu$ g/L) was detected at GW02 in the duplicate sample. Copper also exceeded the screening criterion in the original sample from GW02 (3.4  $\mu$ g/L).

#### Mercury

Mercury (unspeciated) exceeded the groundwater screening criterion (0.025  $\mu g/L$ ) at monitoring well GW02 in both the original and duplicate sample. The maximum concentration (0.24  $\mu g/L$ ) was detected at GW02 in the duplicate sample.

#### Nickel

Nickel exceeded the groundwater screening criterion (8.2  $\mu$ g/L) at all three monitoring wells. The maximum concentration (17  $\mu$ g/L) was detected at GW02.

#### 3.2.3 Organic Compounds in Groundwater

Groundwater samples were also analyzed for pesticides, PCBs, VOCs, SVOCs, and TPH. The sample from GW03 was also analyzed for dioxins. No SVOCs, pesticides, PCBs or dioxins were detected in any of the groundwater samples.

No VOCs were detected in groundwater except for trichloroethene (TCE). TCE was detected in groundwater samples from all three wells ranging in concentration from 0.60  $\mu$ g/L in wells GW01 and GW02 to 0.70  $\mu$ g/L in GW03 (Table 3). Detected concentrations of TCE were only slightly greater than the detection limit of 0.50  $\mu$ g/L. An AWQC value has not been established for TCE

TPH-d was detected in the groundwater sample collected from well GW01 at a concentration of 0.10 mg/L. TPH compounds were not detected in any other groundwater samples (Table 3). There are currently no widely accepted screening criteria for TPH in groundwater.

#### 3.3 DEBRIS TEST HOLE OBSERVATIONS AND SEDIMENT SAMPLE RESULTS

This section describes the subsurface material observed during completion of the five debris test holes (Section 3.3.1) and analytical results for samples collected from sediment underlying the debris at each location (Section 3.3.2).

#### 3.3.1 Debris Test Hole Observations

The procedures used for debris test holes SB201 through SB205 are described in Section 2.3. The debris test hole locations are shown on Figure 3. SB201 through SB205 were excavated to find the vertical extent of the debris on the Site 30 peninsula. Appendix F contains boring logs for each of the debris test holes. Debris test hole profiles for all of the debris test holes and the three well borings completed at Site 30 are shown on Figure 5. The debris test hole profiles are based on the subsurface descriptions contained in the boring logs for each respective test hole and well boring.

The vertical extent of the debris ranged from depths of 4 feet bgs at the end of the peninsula (SB201) to 1 feet bgs in the central portion of the site (SB205). The debris and fill material excavated from test holes SB201 through SB205 was similar to that encountered from test holes in the February 2000 investigation. The debris consisted of a matrix of broken glass, organic silts, and root material.

An organic peat layer was encountered under the debris in the three test holes along the length of the peninsula (SB201 through SB203). The peat layer begins at approximately 4 feet bgs at the tip of the peninsula (SB201), at approximately 3 feet bgs in the middle (SB202), and at approximately 3.5 feet bgs in the first third of the peninsula (SB203). The peat is a saturated, soft, organic layer with low plasticity.

Because of the difficulty associated with augering through saturated debris at test holes SB201 and SB203, samplers were not able to assign an accurate depth interval to material recovered approximately 1 foot above the peat layer. Although this depth interval is indicated as "No Recovery" on the boring logs for SB201 and SB203 (Appendix F), the material in this interval is presumed to be debris at both locations.

Debris test holes SB204 and SB205 are located in the central portion of the site (Figure 3). SB204 is approximately 40 feet west of SB205. The debris layer at SB204 ends at 1.5 feet bgs and is underlain by highly plastic, light brown clay. The debris layer at SB205 ends at 1.0 foot bgs and is underlain by very dark gray, organic silt. A peat layer was not present at SB204 and SB205 (Figure 5).

Well boring GW03 is located approximately 35 feet southwest of SB205 (Figure 3). The debris layer at boring GW03 ended at 0.5 foot bgs and is underlain by highly plastic, gray silty clay to 5.0 feet bgs. Well borings GW01 and GW02 (Figure 3) did not contain any debris (Figure 5).

#### 3.3.2 Sediment Sample Analytical Results

This section summarizes the analytical results for the five sediment samples collected beneath the debris at Site 30 locations SB201 through SB205. Analytical results for the sediment samples are presented in Table 4. Appendix G presents the complete validated analytical results. Section 3.3.2.1 describes the sediment screening criteria used to evaluate chemicals detected in each analyte group. The results of the comparisons of detected analyte concentrations to the sediment screening criteria are presented in Sections 3.3.2.2 through 3.3.2.3.

#### 3.3.2.1 Sediment Screening Criteria

Chemical concentrations in the sediment samples were compared to effects-range low (ER-L) and effects-range median (ER-M) values (Long and others 1995). The ER-L is the concentration at which 10 percent of the toxicity studies showed effects; sediment concentrations below the ER-L are interpreted as being "rarely" associated with adverse effects. The ER-M is the concentration at which 50 percent of the studies showed effects. Concentrations above the ER-M are "frequently" associated with adverse effects (Long and others 1995). ER-Ls and ER-Ms are guidelines developed to identify concentrations of chemicals in sediment associated with biological effects in the laboratory, field, or modeling studies (Long and others 1995), they are not promulgated standards.

In addition, sediment sample concentrations were compared with Bay ambient values (RWQCB 1998). These values provide a good indication of the range of concentrations that can be expected in Bay sediments. The Bay ambient values are thresholds based on the 85th percentile for sediment with 100 percent fines.

The ER-L, ER-M, and Bay ambient concentrations were used as "benchmark values" in reviewing the sediment sample analytical data for this report. ER-M concentrations were set as "high benchmark values." The greater of the ER-L and Bay ambient concentrations, for each respective analyte, was set as the "low benchmark values." This approach is consistent with how data were evaluated in the draft final RI (Tetra Tech 2002).

The PRRL was used as the screening criterion for a subset of chemicals for which the screening value was less than the PRRL. The PRRL is the concentration the analytical laboratory can achieve based on the maximum sensitivity of the analytical method. Chemicals for which this was the case were identified in Appendix D of the SAP (Tetra Tech 2003) and on Table 4.

Table 4 shows the results of the sediment sample analytical analyses and comparison to sediment screening criteria. In Table 4, analyte concentrations exceeding the high benchmark value are shown in bold red numerals, and analyte concentrations exceeding the low benchmark values are shown in bold blue. Figure 9 shows analytes detected in the sediment samples at concentrations exceeding their benchmark values.

In addition to the Bay ambient values for metals that were used to establish low benchmark screening values, ambient metals concentrations for the NWS SBD Concord Tidal Area sediments are also available in Appendix E of the Site 30 RI report (Tetra Tech 2002). The Tidal

Area ambient values provide a good indication of the range of concentrations that can be expected in Tidal Area sediments and are based on the 99th percentile.

Although Tidal Area ambient metal concentrations are not used as benchmark screening values, they are included in the sediment sample data table (Table 4) for comparison to metal concentrations detected in samples.

#### 3.3.2.2 Metals in Sediment

Metals detected in sediment are described in the following sections.

#### **Detected Metals with Benchmark Screening Values**

Arsenic, cadmium, copper, lead, selenium, and zinc were detected at concentrations above sediment benchmark screening values at one or more locations (Table 4 and Figure 9). The results for each of these metals are discussed as follows:

- Arsenic: Arsenic exceeded the low benchmark screening value (Bay ambient: 15.6 mg/kg) in the sediment sample collected from SB201. This sample contained the maximum detected concentration of arsenic (33 mg/kg). The Tidal Area ambient concentration for arsenic (27 mg/kg) exceeds the low benchmark screening value.
- Cadmium: Cadmium was detected at an estimated concentration of 6.10 mg/kg in the sediment sample collected from SB201. This was the maximum cadmium concentration detected and exceeds the low benchmark screening value (ER-L: 1.2 mg/kg). The Tidal Area ambient concentration for cadmium (1.9 mg/kg) exceeds the low benchmark screening value.
- Copper: Copper was detected at concentrations exceeding benchmark screening values in sediment samples from locations SB201, SB202, and SB203. The maximum copper concentration was detected in the sample from SB201 (740 mg/kg), which exceeded the high benchmark value (ER-M: 270 mg/kg). Copper concentrations detected in samples collected from SB202 (92 mg/kg) and SB203 (140 mg/kg) exceeded the low benchmark screening value (Bay ambient: 68.1 mg/kg). The Tidal Area ambient concentration for copper (81 mg/kg) exceeded the low benchmark screening value.
- Lead: Sediment samples collected from locations SB201, SB202, SB203, and SB204 contained lead concentrations that exceeded screening values. The high benchmark screening value (ER-M: 218 mg/kg) was exceeded at SB201 (570 mg/kg) and SB202 (240 mg/kg). The low benchmark screening value (ER-L: 46.7 mg/kg) was exceeded at SB203 (180 mg/kg) and SB204 (100 mg/kg). The Tidal Area ambient concentration for lead (95 mg/kg) exceeds the low benchmark screening value.
- **Selenium:** Selenium was detected at concentrations exceeding the low benchmark screening value (Bay ambient: 0.64 mg/kg) in sediment samples from locations SB201 (1.2 mg/kg) and SB203 (1.0 mg/kg). Selenium was not detected in the sediment sample from SB202.

• Zinc: Zinc was detected at concentrations exceeding benchmark screening values in sediment samples from locations SB201, SB202, and SB203. The maximum zinc concentration was detected in the sample from SB201 (11,000 mg/kg), which exceeded the high benchmark screening value (ER-M: 410 mg/kg). Zinc concentrations detected in samples collected from SB202 (370 mg/kg) and SB203 (290 mg/kg) exceeded the low benchmark screening value (Bay ambient: 158 mg/kg).

#### **Detected Metals without Benchmark Screening Values**

The following metals without benchmark screening values were detected in the sediment samples: aluminum, antimony, barium, beryllium, cobalt, manganese, molybdenum, thallium, and vanadium (Table 4 and Figure 10). Of these metals, antimony, barium, beryllium, molybdenum, and thallium were detected at concentrations that exceeded their respective Tidal Area ambient values.

### 3.3.2.3 Polychlorinated Biphenyls, Pesticides, Semivolatile Organic Compounds, and Total Petroleum Hydrocarbons in Sediment

Sediment samples were also analyzed for PCBs, SVOCs, pesticides, and TPH. Table 4 presents the results of these analyses and the available Bay Ambient ER-L and ER-M screening criteria for the organic analytes. Pesticides, PCBs, and SVOCs were not detected in the sediment samples.

The sample from location SB203 was also analyzed for dioxins/furans. Low concentrations of dioxins and furans were detected in the sample. A total toxicity equivalence quotient (TEQ) of 0.00114 micrograms per kilogram was calculated for the sample following the World Health Organization (1997) guidance, by multiplying the concentrations of all toxic congeners by a toxicity equivalence factor (TEF). The TEQ expresses the toxic dioxins and furans as a concentration of the most toxic form of dioxin, 2,3,7,8-tetrachlorodinbenzo-p-dioxin (2,3,7,8-TCDD). For all calculations of TEQ, zero was substituted for nondetected congeners. No screening criterion was available for dioxin. No specific sources of dioxin, such as incineration, are known to have occurred at the site.

TPH was detected in all five sediment samples as extractable TPHs (TPH-d and TPH-mo); no purgeable TPHs were detected. TPH-d was detected at concentrations ranging from 12 mg/kg in the sample from SB201 to 23 mg/kg in the sample from SB203. TPH-mo was detected at concentrations ranging from 6.1 mg/kg in the sample from SB205 to 110 mg/kg in the sample from SB203. These sample concentrations are shown on Figure 10.

#### 3.4 DATA QUALITY

Data Validation Group, Inc., validated the analytical data following the guidelines put forth in EPA's "Functional Guidelines for Inorganic Data Review" and "Functional Guidelines for Organic Data Review" (EPA 1994, 1999, respectively). Results are presented in Appendix G. Although some of the data were flagged as estimated concentrations, the validation report indicates that the data are of high quality and are acceptable for most uses.

Adherence to the standard quality assurance (QA) and QC techniques set forth in the SAP (Tetra Tech 2003) during field and laboratory operations ensured the quality of the data collected during sediment and groundwater sampling at Site 30. Field QA/QC consisted of collecting one groundwater field duplicate, one equipment rinsate, one source water blank, and two trip blank samples. Table 1 presents the analytical results for the QC samples.

#### 3.4.1 Field Duplicates

A field duplicate groundwater sample was collected from well GW02. The original and duplicate samples contained detected concentrations of aluminum, arsenic, barium, calcium, copper, iron, magnesium, manganese, mercury, molybdenum, nickel, potassium, sodium, vanadium, and zinc. VOCs, SVOCs, pesticides, PCBs, and TPH were not detected in the original and duplicate sample. The duplicate sample results suggest that the sample collection procedure did not vary, thereby achieving consistent results.

Table 5 shows the concentrations of the detected chemicals and the relative percent difference (RPD) between each detected analyte. The RPD for all of the detected metals except aluminum and iron were below the goal of 50 percent RPD. RPD for aluminum and iron were 65 percent and 63.5 percent, respectively; however, 87 percent of the detected analytes were within the RPD goal, indicating the acceptable precision of analytical data collected during this investigation.

#### 3.4.2 Equipment Rinsate Samples

An equipment rinsate is a sample collected after a sampling device is subjected to standard decontamination procedures. One equipment rinsate sample was collected using the sediment sampling auger. Distilled water was poured over and through the sediment auger into sample containers. The sample was analyzed for metals, hexavalent chromium, pesticides, PCBs, SVOCs, and purgeable and extractable TPHs.

Although total chromium, TPH-d, and TPH as gasoline (TPH-g) were detected in the equipment rinsate sample (Table 1), the concentrations of these analytes were not high enough to merit rejecting the sediment sample results for chromium and TPH.

Chromium detected in the equipment rinsate sample could suggest that decontamination practices introduced chromium into one or more sediment samples as the auger was used to complete each sediment boring. Total chromium concentrations in the sediment samples, however, were all below the Tidal Area ambient concentration of 82.1 mg/kg. Consequently, any chromium introduced from a contaminated auger has not increased its concentration in samples enough to merit further consideration.

Despite its detection in the rinsate sample, TPH-g was not detected in any of the sediment samples. TPH-d was detected in most of the sediment samples at concentrations ranging from 12 to 23 mg/kg. Given that the concentration of TPH-d detected in the rinsate sample was very low (an estimated concentration of 0.03 mg/L), it's unlikely the presence of TPH as diesel in the sediment samples is due to cross contamination from poor decontamination practices.

#### 3.4.3 Source Water Blank Samples

The same analyses completed for the equipment rinsate sample were conducted on the distilled water used to pour the rinsate. TPH-d was the only analyte detected in this sample. TPH-d was detected at an estimated concentration of 0.03 mg/L. This is the same concentration of TPH-d detected in the equipment rinsate sample, suggesting possible source water or laboratory-related contamination

#### 3.4.4 Trip Blank Samples

Two trip blanks were analyzed for VOCs to demonstrate that contamination is not originating from sample containers or from any factor during sample transport. The trip blanks originated at the laboratory as 40-milliliter vials filled with reagent-grade, organic-free water. The trip blanks were then transported to the site with the empty containers to be used for sample collection. The trip blanks were stored at the site until the field samples were collected. One trip blank accompanied each sample transport cooler that held water samples for VOC analysis back to the laboratory.

No VOCs were detected in the trip blanks (Table 1), indicating that samples were not contaminated by VOCs from sample containers or any part of transporting the samples to the laboratory.

#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

The following sections provide conclusions and recommendations for Site 30 based on the results of the November 2003 investigation.

#### 4.1 CONCLUSIONS BASED ON GROUNDWATER DATA

Aluminum, arsenic, copper, mercury, and nickel were detected at concentrations above groundwater screening criteria at one or more locations (Table 3 and Figure 8).

No SVOCs, pesticides, PCBs, or dioxins were detected in any of the groundwater samples. No VOCs were detected in groundwater except for low levels of TCE, which were only slightly above the detection limit.

Groundwater level measurements collected from three monitoring wells in November 2003 suggested that the potentiometric surface was nearly flat (gradient was less than 0.001). Water level elevations in the three monitoring wells were within 0.1 foot of each other (Figure 7). Groundwater elevations in February 2004 were more than 1.5 feet higher than the November 2003 elevations. The potentiometric surface for February 19 suggested that groundwater flow was directed to the west at a gradient of approximately 0.002 (Figure 7).

Although aluminum, arsenic, copper, mercury, and nickel were detected at concentrations above groundwater screening criteria, only arsenic and aluminum were notably elevated above their

screening criteria. Aluminum is not expected to be a problem because the pH is relatively neutral. The highest concentration of arsenic (150  $\mu$ g/L) was detected from monitoring well GW01, which is upgradient of the debris field. The exact source of arsenic in monitoring well GW01 is unknown, however it is most likely related to the debris. The hydraulic gradient for the site is nearly flat, which along with the generally low hydraulic conductivities in the subsurface, suggests that the rate of groundwater flow across the site is very low. Therefore, potential groundwater transport of arsenic from the debris is not expected to result in elevated concentrations of arsenic at significant distances from the waste. Surface water transport could cause elevated arsenic concentrations in groundwater if groundwater near the debris was discharging to surface water and arsenic-containing surface water then recharging the groundwater near well GW01. Well GW01 is about 40 feet from the primary debris area. Surface water samples collected by the SF Bay RWQCB do not suggest that arsenic has been released from groundwater at the site at concentrations that may be causing adverse ecological effects (Appendix H). Sediment in the vicinity of GW01 is included in the risk-footprint (see Figure 6).

#### 4.2 CONCLUSIONS BASED ON SEDIMENT DATA

Arsenic, cadmium, copper, lead, selenium, and zinc were detected in sediment beneath the debris at concentrations above benchmark screening values at one or more locations (Table 4 and Figure 9). Concentrations were highest on the peninsula in areas where the debris extends into the groundwater. At location SB201, on the tip of the peninsula, sediment concentrations of copper, lead, and zinc below the debris were detected above ER-Ms (4- to 5-foot depth interval). At location SB205, however, which is in the center of the site where debris does not intersect groundwater, sediment concentrations beneath the debris were not elevated. The findings of the RI (Tetra Tech 2002 and Appendix H) also showed that concentrations in the center of the site were not elevated at depth. Surface sediment or water samples collected about 10 feet offshore from location SB201 by the RWQCB in 2001 did not contain elevated levels of metals (Tetra Tech 2002 and Appendix H). The 2003 sampling investigation results suggest that leaching from the debris to subsurface sediment may be occurring in low-lying areas of the site closest to the shoreline, where the debris is within the groundwater.

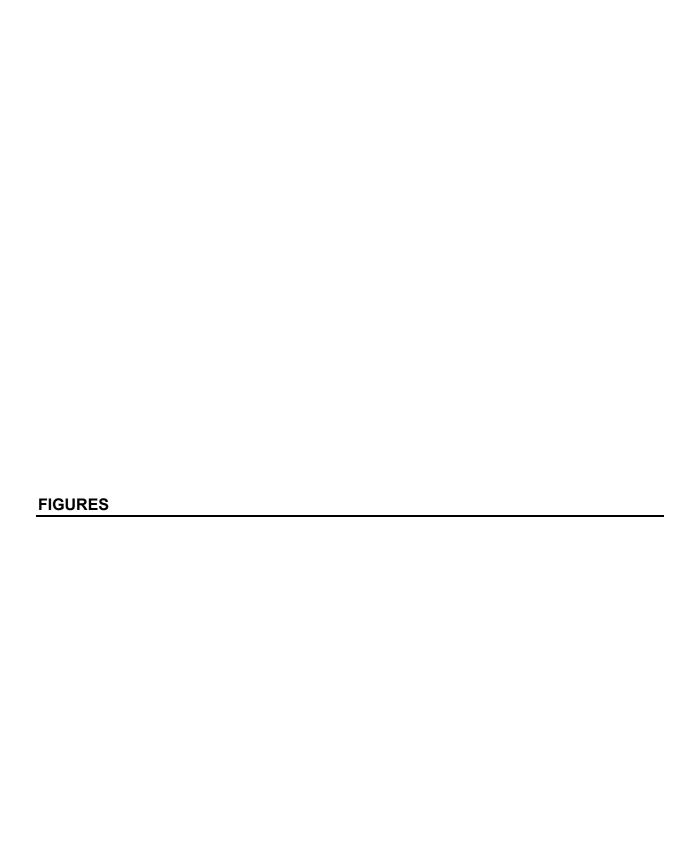
#### 4.3 RECOMMENDATIONS

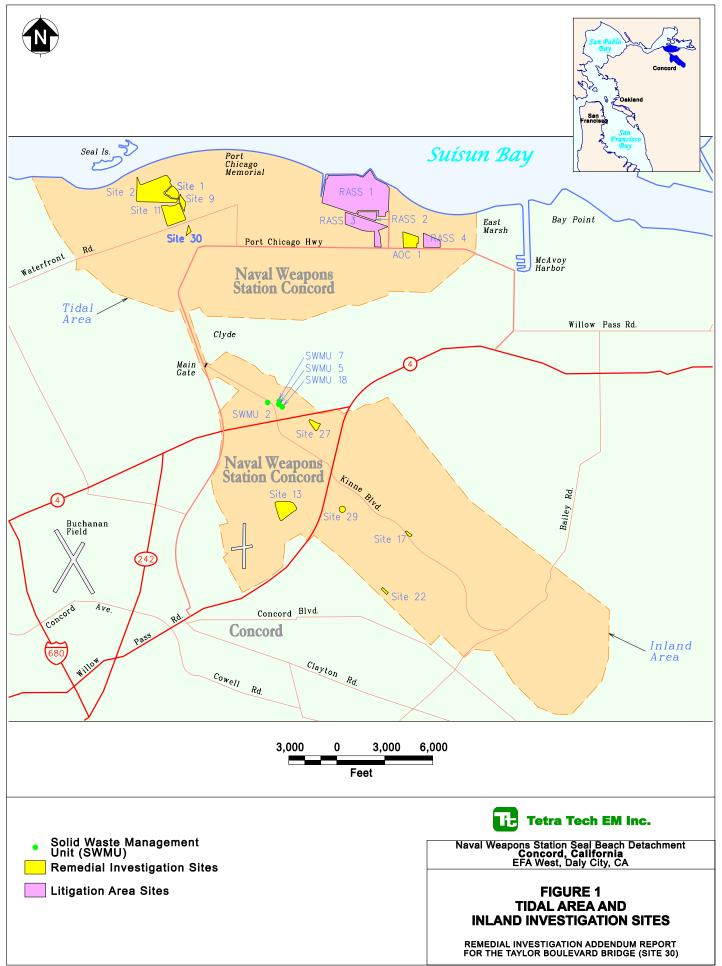
Based on the results of all of the investigations conducted at the site to date, adequate data are available to support that inorganic concentrations in the area of debris at Site 30 are sufficiently high to present a potential risk to plants, benthic invertebrates, and aquatic birds as well as a significant risk to the salt marsh harvest mouse. In order to address the source of contamination, which is the waste, the Navy plans to pursue a non-time-critical removal action (non-TCRA) for the site in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the EPA's implementing regulations in the National Contingency Plan (NCP). A non-TCRA is appropriate for a site where the source of contamination is well-defined, and will expedite cleanup and ultimate site close-out. In accordance with regulations and guidance, the Navy will initiate the non-TCRA process by preparing an engineering evaluation/cost analysis (EE/CA) to identify and evaluate removal action alternatives, and recommend an alternative for the action.

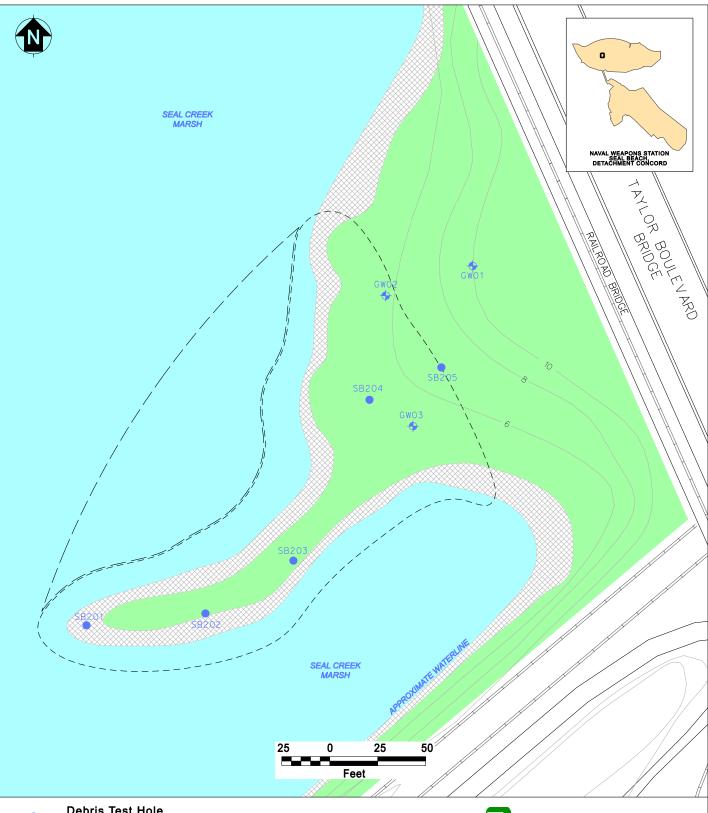
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Groundwater Monitoring Well

Topographic Elevation Contour (feet, NDVD 1929)

Scattered Surface Debris Primary Surface and Subsurface Debris Area Shoreline: Approximate Seasonal Water Level Variations

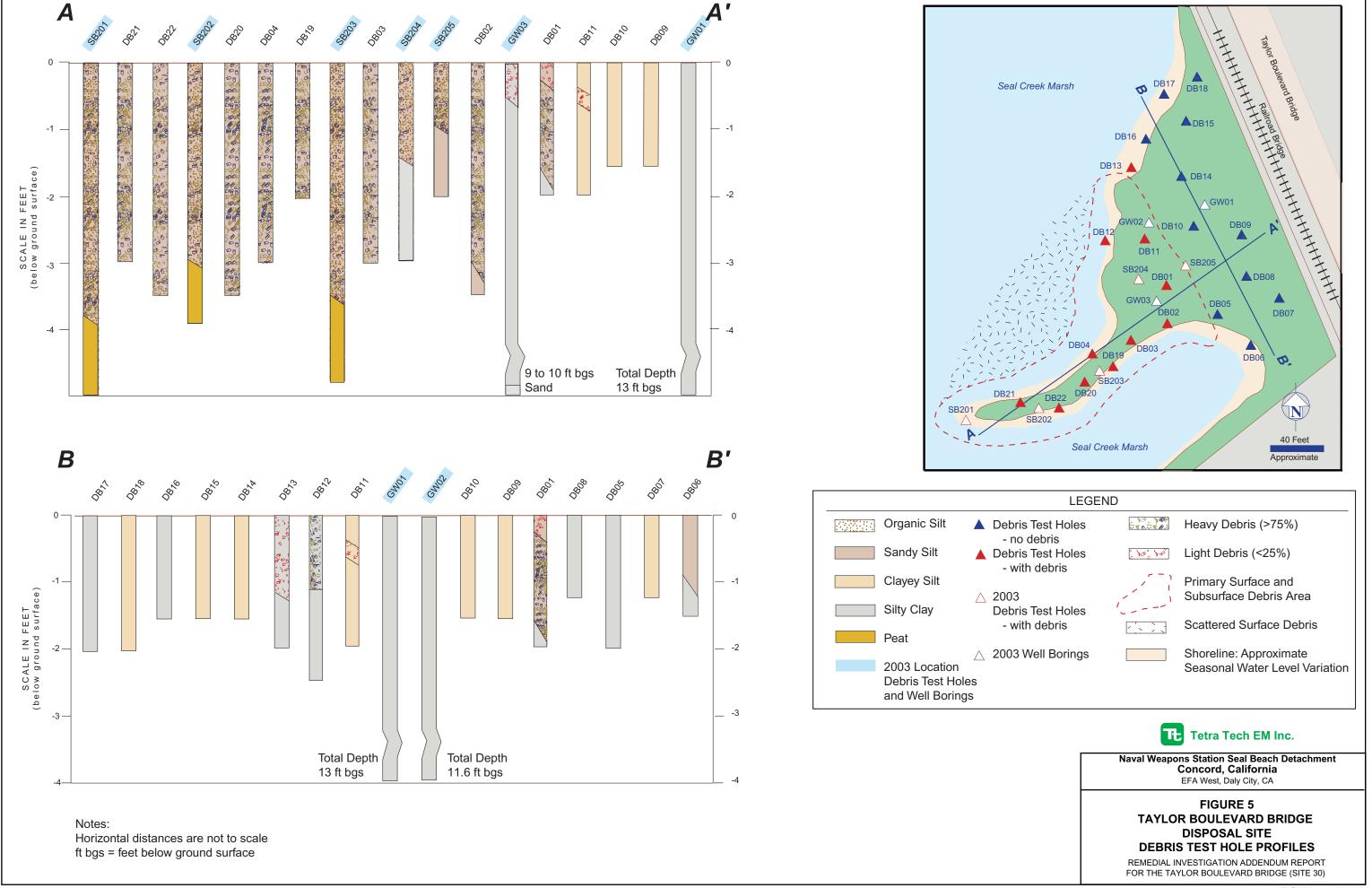


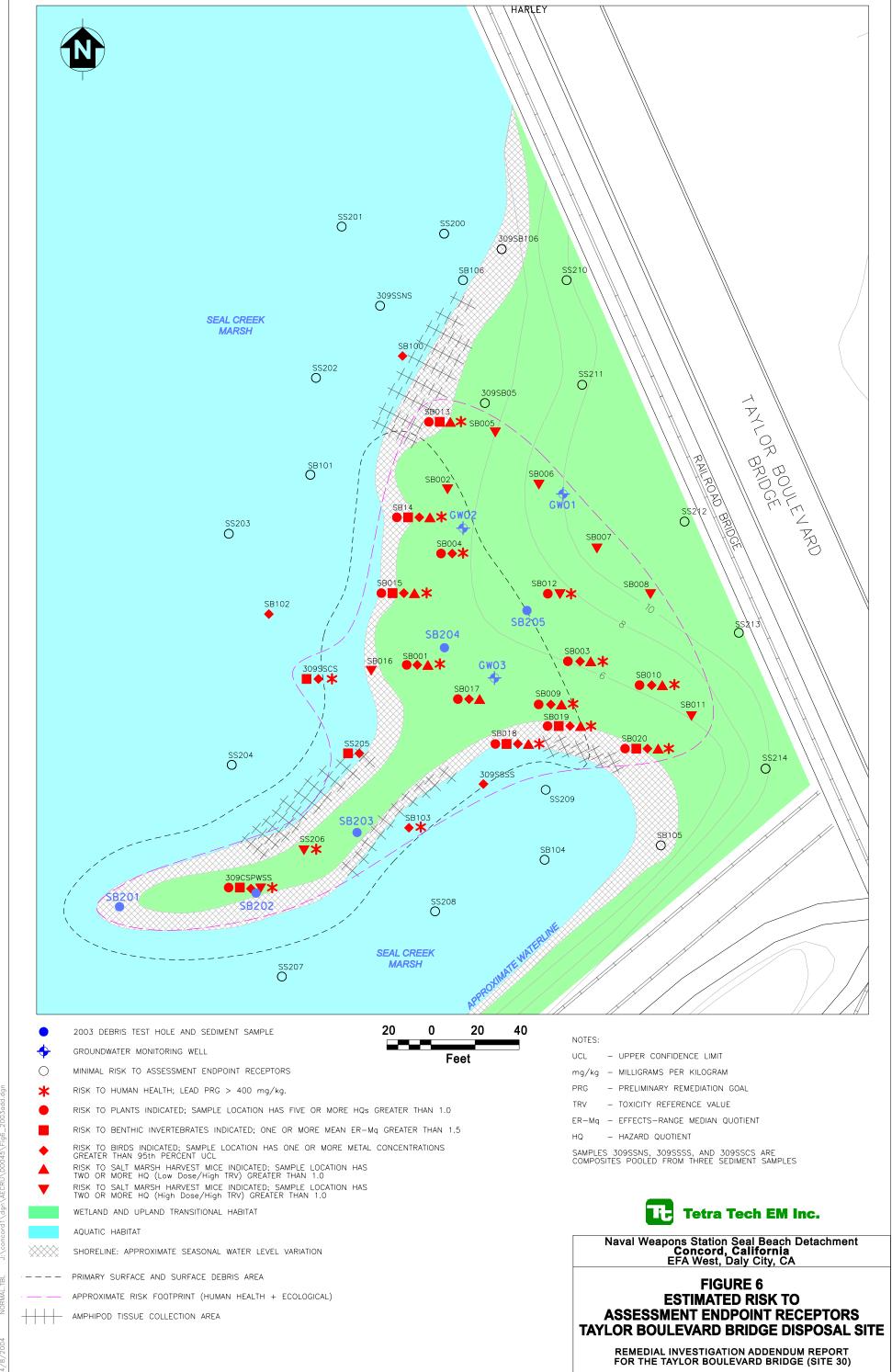
Naval Weapons Station Seal Beach Detachment Concord, California EFA West, Daly City, CA

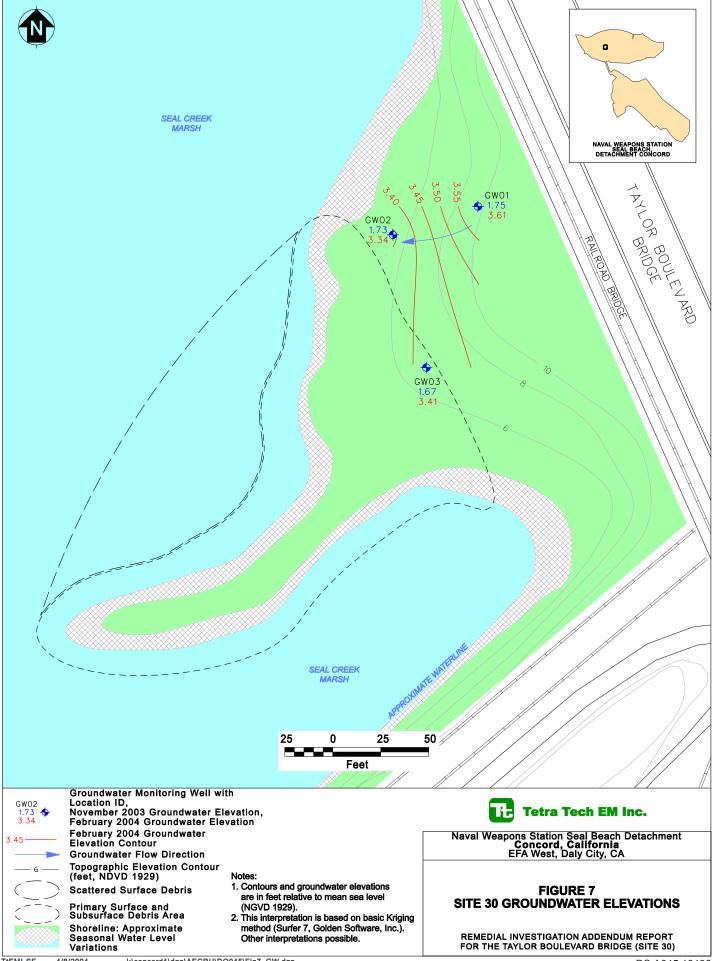
> FIGURE 3 2003 ADDITIONAL REMEDIAL INVESTIGATION SAMPLING LOCATIONS

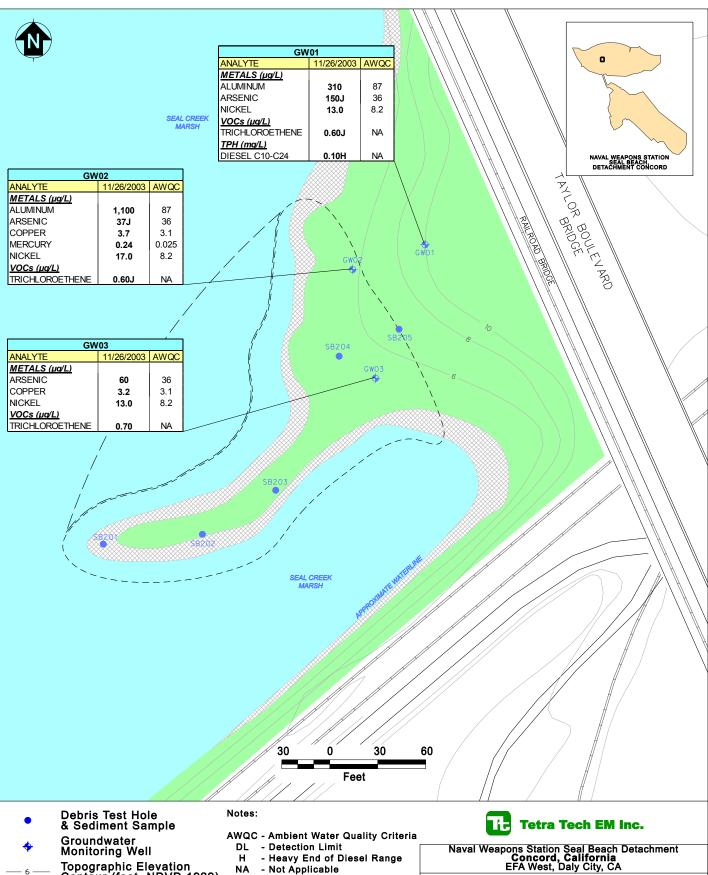
REMEDIAL INVESTIGATION ADDENDUM REPORT FOR THE TAYLOR BOULEVARD BRIDGE (SITE 30)











Topographic Elevation Contour (feet, NDVD 1929)



Primary Surface and Subsurface Debris Area

Shoreline: Approximate Seasonal Water Level Variations

- Not Applicable NA

- Estimated

TPH - Total Petroleum Hydrocarbons

U - Nondetect

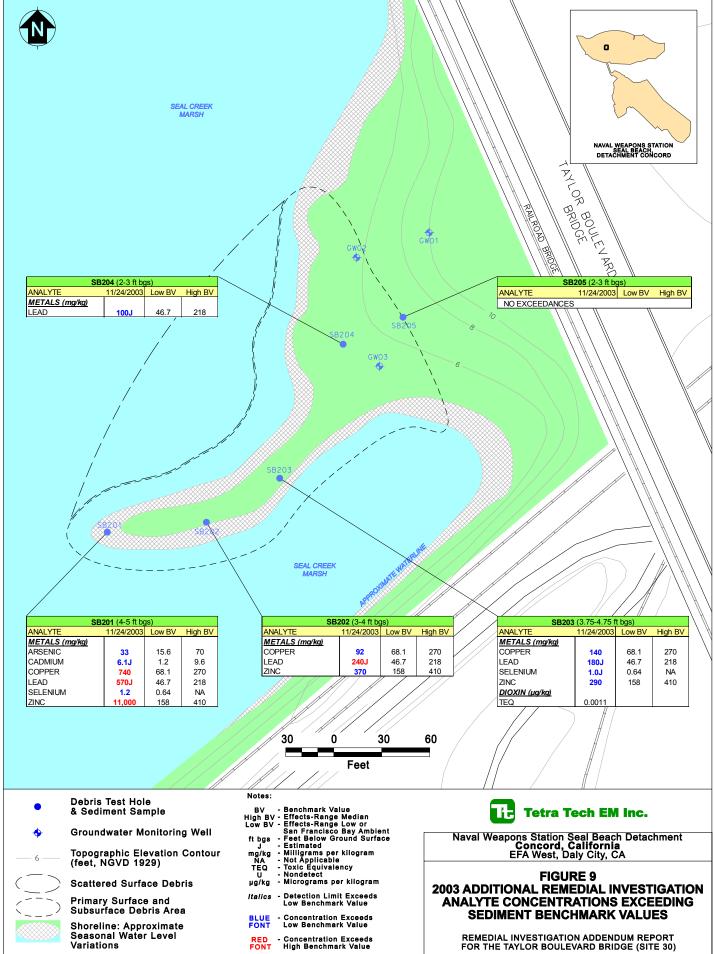
VOCs - Volatile Organic Compounds

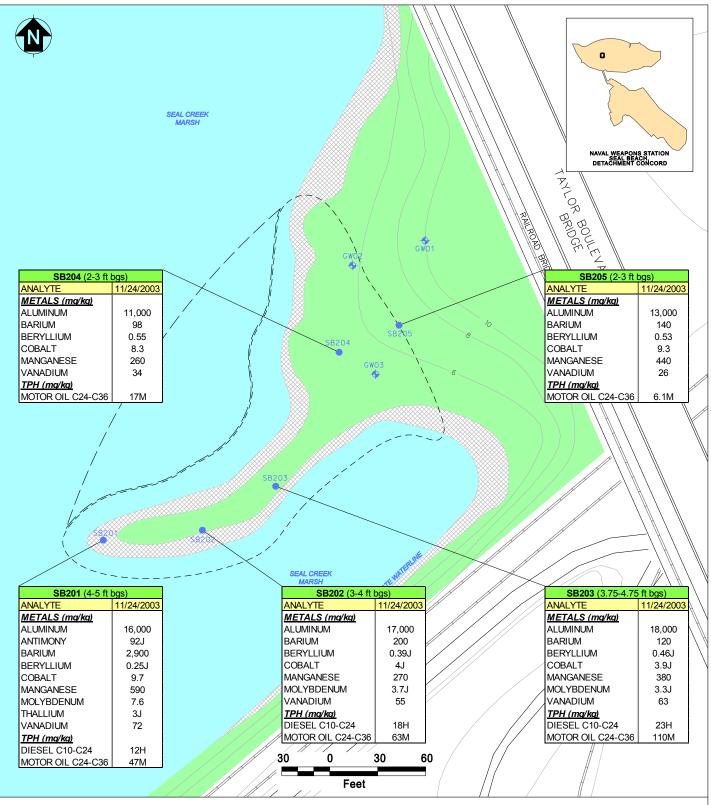
mg/L - Milligrams per Liter μg/L - Micrograms per Liter

DL > AWQC

### FIGURE 8 **2003 ADDITIONAL REMEDIAL INVESTIGATION METAL CONCENTRATIONS EXCEEDING AWQC IN GROUNDWATER** AND DETECTED ORGANIC ANALYTES

REMEDIAL INVESTIGATION ADDENDUM REPORT FOR THE TAYLOR BOULEVARD BRIDGE (SITE 30)







**Groundwater Monitoring Well** Topographic Elevation Contour (feet, NDVD 1929)



Primary Surface and Subsurface Debris Area Shoreline: Approximate Seasonal Water Level Variations

#### Notes:

ft bgs - Feet Below Ground Surface

-Heavy End of Diesel Range

- Estimated

- Motor Oil Range

mg/kg - Milligrams per Kilogram

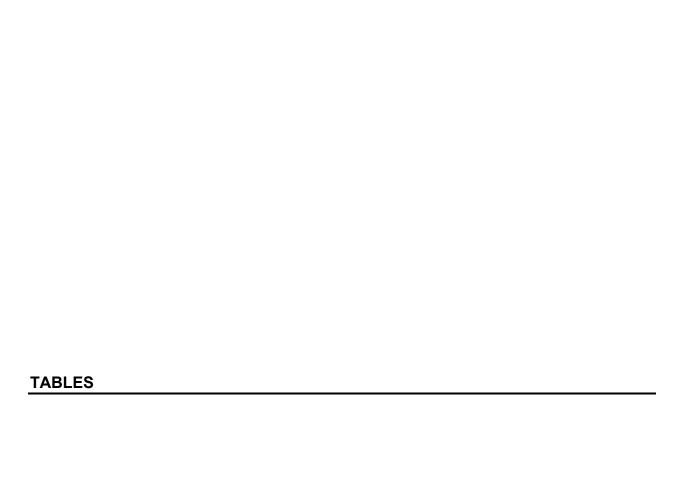


# Life Tetra Tech EM Inc.

Naval Weapons Station Seal Beach Detachment Concord, California EFA West, Daly City, CA

### FIGURE 10 **2003 ADDITIONAL REMEDIAL INVESTIGATION DETECTED SEDIMENT ANALYTES** WITHOUT BENCHMARK VALUES

REMEDIAL INVESTIGATION ADDENDUM REPORT FOR THE TAYLOR BOULEVARD BRIDGE (SITE 30)



# TABLE 1: ANALYTICAL DATA FOR QUALITY CONTROL SAMPLES

	Point ID Number: Sample ID Number: Sample Type: Matrix: Sample Date:	QC SAMPLE 04530ER01 Equipment Rinsate WATER 11/25/2003		QC SAMPLE 04530SB01 Source Blank WATER 11/25/2003		QC SAMPLE 04530TB01 Trip Blank WATER 11/25/2003		QC SAMPLE 04530TB02 Trip Blank WATER 11/26/2003		GW02 04530GW002D Field Duplicate WATER 11/26/2003	
CLP Metals (µg/L)		22.00		10.00		N.1.0		NIA		560.00	
Aluminum		32.00	UJ	18.00	UJ	NA NA		NA NA		560.00	
Antimony		60.00	U	60.00	U	NA NA				60.00	U
Arsenic		5.00	U	5.00	U	NA NA		NA NA		34.00	J
Barium		0.52	UJ	10.00	U	NA NA		NA NA		32.00	
Beryllium		0.50	UJ	0.84	UJ	NA NA		NA NA		2.00	U
Cadmium		5.00	U	5.00	U	NA NA		NA NA		5.00	U
Calcium		500.00	U	130.00	UJ			NA NA		29,000.00	
Chromium		0.32	J	10.00	U	NA NA				10.00	U
Chromium VI		10.00	UJ	10.00	U	NA		NA		10.00	U
Cobalt		20.00	U	20.00	U	NA		NA		20.00	U
Copper		1.00	U	1.00	U	NA		NA		3.70	
Iron		100.00	U	100.00	U	NA		NA		570.00	
Lead		3.00	UJ	3.00	U	NA		NA		3.00	U
Magnesium		500.00	U	280.00	J	NA		NA		51,000.00	<u>J</u>
Manganese		10.00	U	1.30	J	NA		NA		290.00	J
Mercury		0.20	U	0.20	U	NA		NA		0.24	
Molybdenum		20.00	UJ	20.00	U	NA		NA		90.00	
Nickel		1.00	U	1.00	U	NA		NA		17.00	
Potassium		500.00	U	500.00	U	NA		NA		41,000.00	J
Selenium		5.00	U	5.00	U	NA		NA		5.00	U
Silver		5.00	U	5.00	U	NA		NA		5.00	U
Sodium		500.00	U	500.00	U	NA		NA		1,700,000.00	
Thallium		5.00	U	5.00	U	NA		NA		5.00	U
Vanadium		10.00	U	10.00	U	NA		NA		16.00	
Zinc		20.00	UJ	3.80	UJ	NA		NA		13.00	J
<b>Volatile Organic Co</b>	mpounds, Method 82	60 (μg/L)									
1,1,1-Trichloroethane	9	NA		NA		0.50	U	1.00	UJ	1.00	UJ
1,1,2,2-Tetrachloroet	thane	NA		NA		0.50	U	1.00	UJ	1.00	UJ
1,1,2-Trichloroethane	9	NA		NA		0.50	U	1.00	UJ	1.00	UJ
1,1-Dichloroethane		NA		NA		0.50	U	1.00	UJ	1.00	UJ
1,1-Dichloroethene		NA		NA		0.50	U	1.00	UJ	1.00	UJ
1,2-Dichloroethane		NA		NA		0.50	U	1.00	UJ	1.00	UJ
1,2-Dichloroethene (1	total)	NA		NA		0.50	U	1.00	UJ	1.00	UJ
1,2-Dichloropropane	•	NA		NA		0.50	Ū	1.00	UJ	1.00	UJ
2-Butanone		NA		NA		10.00	Ū	10.00	UJ	10.00	UJ
2-Hexanone		NA		NA		10.00	Ü	10.00	UJ	10.00	UJ
4-Methyl-2-pentanon	e	NA		NA		10.00	U	10.00	UJ	10.00	UJ
Acetone	-	NA		NA		10.00	U	10.00	UJ	10.00	UJ

# TABLE 1: ANALYTICAL DATA FOR QUALITY CONTROL SAMPLES

Matrix Sample Date	: 04530ER01 : Equipment Rinsate : WATER : 11/25/2003		QC SAMPLE 04530SB01 Source Blan WATER 11/25/2003		QC SAMPLE 04530TB01 Trip Blank WATER 11/25/2003		QC SAMPLE 04530TB02 Trip Blank WATER 11/26/2003		GW02 04530GW002D Field Duplicate WATER 11/26/2003	
Volatile Organic Compounds, Method 8	• , ,	l)								
Benzene	NA NA		NA		0.50	U	1.00	UJ	1.00	UJ
Bromodichloromethane	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Bromoform	NA NA		NA		1.00	U	1.00	UJ	1.00	UJ
Bromomethane	NA NA		NA		1.00	U	1.00	UJ	1.00	UJ
Carbon disulfide	NA NA		NA		0.50	U	1.00	UJ	1.00	UJ
Carbon tetrachloride	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Chlorobenzene	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Chloroethane	NA		NA		1.00	U	1.00	UJ	1.00	UJ
Chloroform	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Chloromethane	NA		NA		1.00	U	1.00	UJ	1.00	UJ
cis-1,3-Dichloropropene	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Dibromochloromethane	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Ethylbenzene	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Methylene chloride	NA		NA		10.00	UJ	10.00	UJ	10.00	UJ
Styrene	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Tetrachloroethene	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Toluene	NA		NA		0.50	U	1.00	UJ	1.00	UJ
trans-1,3-Dichloropropene	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Trichloroethene	NA		NA		0.50	U	1.00	UJ	0.50	J
Vinyl acetate	NA		NA		10.00	U	10.00	UJ	10.00	UJ
Vinyl chloride	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Xylene (total)	NA		NA		0.50	U	1.00	UJ	1.00	UJ
Semivolatile Organic Compounds, Meth										
1,2,4-Trichlorobenzene	9.50	U	9.50	U	NA		NA		9.40	U
1,2-Dichlorobenzene	9.50	U	9.50	U	NA		NA		9.40	U
1,3-Dichlorobenzene	9.50	U	9.50	U	NA		NA		9.40	U
1,4-Dichlorobenzene	9.50	U	9.50	U	NA		NA		9.40	U
2,4,5-Trichlorophenol	9.50	U	9.50	U	NA		NA		9.40	U
2,4,6-Trichlorophenol	9.50	U	9.50	U	NA		NA		9.40	U
2,4-Dichlorophenol	9.50	U	9.50	U	NA		NA		9.40	U
2,4-Dimethylphenol	9.50	U	9.50	U	NA		NA		9.40	U
2,4-Dinitrophenol	48.00	U	48.00	U	NA		NA		47.00	U
2,4-Dinitrotoluene	9.50	U	9.50	U	NA		NA		9.40	U
2,6-Dinitrotoluene	9.50	U	9.50	U	NA		NA		9.40	U
2-Chloronaphthalene	9.50	U	9.50	U	NA		NA		9.40	U
2-Chlorophenol	9.50	U	9.50	U	NA		NA		9.40	U
2-Methylnaphthalene	9.50	U	9.50	U	NA		NA		9.40	U
2-Methylphenol	9.50	U	9.50	U	NA		NA		9.40	U

TABLE 1: ANALYTICAL DATA FOR QUALITY CONTROL SAMPLES

	Point ID Number: Sample ID Number: Sample Type: Matrix: Sample Date:	QC SAMPLE 04530ER01 Equipment Rinsate WATER 11/25/2003	)	QC SAMPLE 04530SB01 Source Blank WATER 11/25/2003		QC SAMPLE 04530TB01 Trip Blank WATER 11/25/2003	QC SAMPLE 04530TB02 Trip Blank WATER 11/26/2003	GW02 04530GW002 Field Duplicat WATER 11/26/2003	_
Semivolatile Organ	ic Compounds, Metho	od 8270 (µg/L) (conti	nued	)					
2-Nitroaniline		19.00	U	19.00	U	NA	NA	19.00	U
2-Nitrophenol		19.00	U	19.00	U	NA	NA	19.00	U
3,3'-Dichlorobenzidin	ie	19.00	U	19.00	U	NA	NA	19.00	U
3-Nitroaniline		19.00	U	19.00	U	NA	NA	19.00	U
4,6-Dinitro-2-methylp	phenol	48.00	U	48.00	U	NA	NA	47.00	U
4-Bromophenyl-phen	ylether	9.50	U	9.50	U	NA	NA	9.40	U
4-Chloro-3-methylph	enol	9.50	U	9.50	U	NA	NA	9.40	U
4-Chloroaniline		9.50	U	9.50	U	NA	NA	9.40	U
4-Chlorophenyl-phen	ylether	9.50	U	9.50	U	NA	NA	9.40	U
4-Methylphenol	,	9.50	U	9.50	U	NA	NA	9.40	U
4-Nitroaniline		19.00	Ū	19.00	Ū	NA	NA	19.00	Ū
4-Nitrophenol		19.00	U	19.00	U	NA	NA	19.00	Ū
Acenaphthene		9.50	Ü	9.50	Ū	NA	NA	9.40	Ū
Acenaphthylene		9.50	Ü	9.50	U	NA	NA	9.40	Ü
Anthracene		9.50	Ü	9.50	Ū	NA	NA	9.40	Ū
Benzo(a)anthracene		9.50	Ü	9.50	Ū	NA	NA	9.40	Ü
Benzo(a)pyrene		9.50	Ü	9.50	U	NA	NA	9.40	Ü
Benzo(b)fluoranthene	e	9.50	U	9.50	U	NA	NA	9.40	Ū
Benzo(g,h,i)perylene		9.50	Ü	9.50	U	NA	NA	9.40	Ü
Benzo(k)fluoranthene		9.50	Ü	9.50	U	NA	NA	9.40	Ü
Bis(2-chloroethoxy)m		9.50	U	9.50	U	NA	NA	9.40	Ü
Bis(2-chloroethyl)eth		9.50	U	9.50	U	NA	NA	9.40	U
Bis(2-chloroisopropyl		9.50	U	9.50	U	NA	NA	9.40	U
Bis(2-ethylhexyl)phth		9.50	U	9.50	U	NA	NA	9.40	U
Butylbenzylphthalate		9.50	U	9.50	U	NA	NA	9.40	U
Carbazole	•	9.50	U	9.50	U	NA	NA	9.40	U
Chrysene		9.50	U	9.50	U	NA NA	NA NA	9.40	U
Di-n-butylphthalate		9.50	U	9.50	U	NA NA	NA NA	9.40	U
Di-n-octylphthalate		9.50	U	9.50	U	NA NA	NA NA	9.40	U
Dibenz(a,h)anthracer	20	9.50	U	9.50	U	NA NA	NA NA	9.40	U
Dibenzofuran	ile	9.50	U	9.50	U	NA NA	NA NA	9.40	U
Diethylphthalate		9.50	U	9.50	U	NA NA	NA NA	9.40	U
Diethylphthalate		9.50	U	9.50	U	NA NA	NA NA	9.40	U
Fluoranthene		9.50	U	9.50	U	NA NA	NA NA	9.40	U
Fluoranthene		9.50	U	9.50	U	NA NA	NA NA	9.40	U
Hexachlorobenzene		9.50	U	9.50 9.50	U	NA NA	NA NA	9.40 9.40	U
		9.50 9.50	U	9.50 9.50	U	NA NA	NA NA	9.40	U
Hexachlorobutadiene Hexachlorocyclopenta		9.50 48.00	U	9.50 48.00	U	NA NA	NA NA	9.40 47.00	U U

TABLE 1: ANALYTICAL DATA FOR QUALITY CONTROL SAMPLES

Matrix:	04530ER01 Equipment Rinsate WATER	)	QC SAMPLE 04530SB01 Source Blank WATER		QC SAMPLE 04530TB01 Trip Blank WATER	QC SAMPLE 04530TB02 Trip Blank WATER	GW02 04530GW002 Field Duplicat WATER	
Sample Date:	11/25/2003		11/25/2003		11/25/2003	11/26/2003	11/26/2003	
Semivolatile Organic Compounds, Metho	od 8270 (µg/L) (conti	nuec	d)					-
Hexachloroethane	9.50	U	9.50	U	NA	NA	9.40	U
Indeno(1,2,3-cd)pyrene	9.50	U	9.50	U	NA	NA	9.40	U
Isophorone	9.50	U	9.50	U	NA	NA	9.40	U
N-nitroso-di-n-propylamine	9.50	U	9.50	U	NA	NA	9.40	U
N-nitrosodimethylamine	9.50	U	9.50	U	NA	NA	9.40	U
N-nitrosodiphenylamine	9.50	U	9.50	U	NA	NA	9.40	U
Naphthalene	9.50	U	9.50	U	NA	NA	9.40	U
Nitrobenzene	9.50	U	9.50	U	NA	NA	9.40	U
Pentachlorophenol	19.00	U	19.00	U	NA	NA	19.00	U
Phenanthrene	9.50	U	9.50	U	NA	NA	9.40	U
Phenol	9.50	U	9.50	U	NA	NA	9.40	U
Pyrene	9.50	U	9.50	U	NA	NA	9.40	U
Pesticides (µg/L)								
4,4'-DDD	0.10	U	0.10	U	NA	NA	0.09	U
4,4'-DDE	0.10	U	0.10	U	NA	NA	0.09	U
4,4'-DDT	0.10	U	0.10	U	NA	NA	0.09	U
Aldrin	0.05	U	0.05	U	NA	NA	0.05	U
Alpha-BHC	0.05	U	0.05	U	NA	NA	0.05	U
Alpha-chlordane	0.05	U	0.05	U	NA	NA	0.05	U
Beta-BHC	0.05	U	0.05	U	NA	NA	0.05	U
Delta-BHC	0.05	U	0.05	U	NA	NA	0.05	U
Dieldrin	0.10	U	0.10	U	NA	NA	0.09	U
Endosulfan I	0.05	U	0.05	U	NA	NA	0.05	U
Endosulfan II	0.10	U	0.10	U	NA	NA	0.09	U
Endosulfan sulfate	0.10	U	0.10	U	NA	NA	0.09	U
Endrin	0.10	U	0.10	U	NA	NA	0.09	U
Endrin aldehyde	0.10	U	0.10	U	NA	NA	0.09	U
Gamma-BHC	0.05	U	0.05	U	NA	NA	0.05	U
Gamma-chlordane	0.05	U	0.05	U	NA	NA	0.05	U
Heptachlor	0.05	Ū	0.05	Ū	NA	NA	0.05	U
Heptachlor epoxide	0.05	Ū	0.05	Ū	NA	NA	0.05	U
Methoxychlor	0.50	U	0.50	Ū	NA	NA	0.50	U
Toxaphene	1.00	Ū	1.00	Ū	NA	NA	0.90	Ū

TABLE 1: ANALYTICAL DATA FOR QUALITY CONTROL SAMPLES

Point ID Numbe Sample ID Numbe Sample Typ Matri: Sample Dat	r: 04530ER01 e: Equipment Rinsate x: WATER		QC SAMPLE 04530SB01 Source Blank WATER 11/25/2003		QC SAMPLE 04530TB01 Trip Blank WATER 11/25/2003	QC SAMPLE 04530TB02 Trip Blank WATER 11/26/2003	GW02 04530GW002 Field Duplicat WATER 11/26/2003	
Polychlorinated Biphenyls (μg/L)								
Aroclor-1016	0.48	UJ	0.48	UJ	NA	NA	0.47	UJ
Aroclor-1221	0.95	UJ	0.95	UJ	NA	NA	0.94	UJ
Aroclor-1232	0.48	UJ	0.48	UJ	NA	NA	0.47	UJ
Aroclor-1242	0.48	U	0.48	U	NA	NA	0.47	U
Aroclor-1248	0.48	U	0.48	U	NA	NA	0.47	U
Aroclor-1254	0.48	U	0.48	U	NA	NA	0.47	U
Aroclor-1260	0.48	U	0.48	U	NA	NA	0.47	U
Total Petroleum Hydrocarbons (mg/L)								
Gasoline range organics	0.72	G	0.05	U	NA	NA	0.05	U
Diesel C10-C24 (sgcu)	0.03	J	0.03	J	NA	NA	0.05	U
Motor oil C24-C36 (sgcu)	0.30	U	0.30	UJ	NA	NA	0.30	U

Notes:

Inorganic results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures.

μg/L Micrograms per liter

BHC "Benzene hexachloride" (Hexachlorocyclohexane)

C#-C# Indicates the range in number of carbon "C" atoms in the hydrocarbon compounds detected

CLP Contract Laboratory Program

DDD Dichlorodiphenyldichloroethane

DDE Dichlorodiphenyldichloroethylene

DDT Dichlorodiphenyltrichloroethane

ID Identification

J Estimated

mg/L Milligrams per liter

NA Not analyzed

QC Quality control

U Not detected, with detection limit indicated

sgcu Silica gel clean-up method used in the analysis for these hydrocarbon compounds

**TABLE 2: SITE 30 GROUNDWATER ELEVATIONS** 

Monitoring Well	TOC (feet above msl)	Depth to Groundwater November 26, 2003 (feet below TOC)	Depth to Groundwater February 19, 2004 (feet below TOC)	Groundwater Elevation November 26, 2003 (feet msl)	Groundwater Elevation February 19, 2004 (feet msl)
GW001	9.12	7.37	5.51	1.75	3.61
GW002	5.93	4.20	2.59	1.73	3.34
GW003	5.91	4.24	2.50	1.67	3.41

Notes:

msl Mean sea level TOC Top of casing

TABLE 3: SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

	Point ID Number: Sample ID Number: Matrix: Sample Date:	GW01 04530GW001 WATER 11/26/2003	GW02 04530GW002 WATER 11/26/2003	GW02 04530GW002D WATER 11/26/2003	GW03 04530GW003 WATER 11/26/2003	AWQC <sup>a</sup> (µg/L)	PRRL (μg/L)
CLP Metals (µg/L	.)						
Aluminum		310.00	1,100.00	560.00	180.00 UJ	87	not applicable
Antimony		60.00 U	36.00 UJ	60.00 U	60.00 U	not available	not applicable
Arsenic		<b>150.00</b> J	<b>37.00</b> J	34.00 J	60.00	36	not applicable
Barium		22.00	37.00	32.00	94.00	not available	not applicable
Beryllium		2.00 U	2.00 U	2.00 U	2.00 U	not available	not applicable
Cadmium		5.00 U	5.00 U	5.00 U	5.00 U	0.6	5
Calcium		19,000.00	30,000.00	29,000.00	73,000.00	not available	not applicable
Chromium III		10.00 U	10.00 U	10.00 U	10.00 U	230.7	not applicable
Chromium VI		10.00 U	10.00 U	10.00 U	10.00 U	230.7	not applicable
Cobalt		20.00 U	20.00 U	20.00 U	2.10 J	not available	not applicable
Copper		2.60	3.40	3.70	3.20	3.1	not applicable
Iron		240.00	1,100.00	570.00	320.00	not available	not applicable
Lead		3.00 U	3.00 U	3.00 U	7.50 UJ	8.1	not applicable
Magnesium		37,000.00 J	53,000.00 J	51,000.00 J	180,000.00	not available	not applicable
Manganese		160.00 J	300.00 J	290.00 J	790.00	not available	not applicable
Mercury		<b>0.20</b> ∪	0.21	0.24	<b>0.20</b> U	0.025	0.1
Molybdenum		73.00	92.00	90.00	50.00 UJ	not available	not applicable
Nickel		13.00	17.00	17.00	13.00	8.2	not applicable
Potassium		24,000.00 J	42,000.00 J	41,000.00 J	79,000.00	not available	not applicable
Selenium		3.60 UJ	5.00 U	5.00 U	5.00 U	4.6	5
Silver		5.00 U	5.00 U	5.00 U	5.00 U	3.45	10
Sodium		1,400,000.00	1,600,000.00	1,700,000.00	2,800,000.00	not available	not applicable
Thallium		5.00 U	3.90 J	5.00 U	2.20 UJ	not available	not applicable
Vanadium		5.30 J	18.00	16.00	1.30 J	not available	not applicable
Zinc		20.00 U	21.00	13.00 J	9.80 UJ	81	not applicable
PCBs (µg/L)							
Aroclor-1016		0.48 UJ	0.47 UJ	0.47 UJ	0.48 UJ	0.03	1
Aroclor-1221		0.95 UJ	0.94 UJ	0.94 UJ	0.96 UJ	0.03	2
Aroclor-1232		0.48 UJ	0.47 UJ	0.47 UJ	0.48 UJ	0.03	1
Aroclor-1242		0.48 U	0.47 U	0.47 U	0.48 U	0.03	1
Aroclor-1248		0.48 U	0.47 U	0.47 U	0.48 U	0.03	1
Aroclor-1254		0.48 U	0.47 U	0.47 U	0.48 U	0.03	1
Aroclor-1260		0.48 U	0.47 U	0.47 U	0.48 U	0.03	1

TABLE 3: SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

S	Point ID Number: ample ID Number: Matrix: Sample Date:	GW01 04530GW001 WATER 11/26/2003	GW02 04530GW002 WATER 11/26/2003	GW02 04530GW002D WATER 11/26/2003	GW03 04530GW003 WATER 11/26/2003	AWQC <sup>a</sup> (μg/L)	PRRL (µg/L)
Pesticides (µg/L)							
4,4'-DDD		0.1 U	0.09 U	0.09 U	0.10 U	not available	0.1
4,4'-DDE		0.1 U	0.09 U	0.09 U	0.10 U	not available	0.1
4,4'-DDT		0.1 U	0.09 U	0.09 U	0.10 U	0.0010	0.1
Aldrin		0.05 U	0.05 U	0.05 U	0.05 U	not available	0.05
Alpha-BHC		0.05 U	0.05 U	0.05 U	0.05 U	not available	0.05
Alpha-chlordane		0.05 U	0.05 U	0.05 U	0.05 U	0.0040	0.05
Beta-BHC		0.05 U	0.05 U	0.05 U	0.05 U	not available	not applicable
Delta-BHC		0.05 U	0.05 U	0.05 U	0.05 U	not available	not applicable
Dieldrin		0.1 U	0.09 U	0.09 U	0.10 U	0.0019	0.1
Endosulfan I		0.05 U	0.05 U	0.05 U	0.05 U	0.0087	0.05
Endosulfan II		0.1 U	0.09 U	0.09 U	0.10 U	0.0087	0.1
Endosulfan Sulfate		0.1 U	0.09 U	0.09 U	0.10 U	0.0087	0.1
Endrin		0.1 U	0.09 U	0.09 U	0.10 U	0.0023	0.1
Endrin Aldehyde		0.1 U	0.09 U	0.09 U	0.10 U	not available	not applicable
Gamma-BHC		0.05 U	0.05 U	0.05 U	0.05 U	not available	not applicable
Gamma-chlordane		0.05 U	0.05 U	0.05 U	0.05 U	0.0040	0.05
Heptachlor		0.05 U	0.05 U	0.05 U	0.05 U	0.0036	0.05
Heptachlor Epoxide	<b>)</b>	0.05 U	0.05 U	0.05 U	0.05 U	0.0036	0.05
Methoxychlor		0.5 U	0.50 U	0.50 U	0.50 U	0.0300	0.05
Toxaphene		1 U	0.90 U	0.90 U	1.00 U	0.0002	1
Semivolatile Organi	c Compounds (µg/L						
1,2,4-Trichlorobenz	zene	9.50 U	9.40 U	9.40 U	9.60 U	129.00	not applicable
1,2-Dichlorobenzen	ie	9.50 U	9.40 U	9.40 U	9.60 U	129.00	not applicable
1,3-Dichlorobenzen	ie	9.50 U	9.40 U	9.40 U	9.60 U	129.00	not applicable
1,4-Dichlorobenzen	ie	9.50 U	9.40 U	9.40 U	9.60 U	129.00	not applicable
2,4,5-Trichloropher	nol	9.50 U	9.40 U	9.40 U	9.60 U	11.00	not applicable
2,4,6-Trichloropher		9.50 U	9.40 U	9.40 U	9.60 U	970.00	not applicable
2,4-Dichlorophenol		9.50 U	9.40 U	9.40 U	9.60 U	365.00	not applicable
2,4-Dimethylpheno	1	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
2,4-Dinitrophenol		48.00 U	47.00 U	47.00 U	48.00 U	150.00	not applicable
2,4-Dinitrotoluene		9.50 U	9.40 U	9.40 U	9.60 U	370.00	not applicable
2,6-Dinitrotoluene		9.50 U	9.40 U	9.40 U	9.60 U	370.00	not applicable

TABLE 3: SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID Number: Sample ID Number: Matrix: Sample Date:	GW01 04530GW001 WATER 11/26/2003	GW02 04530GW002 WATER 11/26/2003	GW02 04530GW002D WATER 11/26/2003	GW03 04530GW003 WATER 11/26/2003	AWQC <sup>a</sup> (μg/L)	PRRL (µg/L)
Semivolatile Organic Compounds (µg/l		11/20/2000	11/20/2000	11/20/2000		
2-Chloronaphthalene	9.50 U	9.40 U	9.40 U	9.60 U	7.5	10
2-Chlorophenol	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
2-Methylnaphthalene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
2-Methylphenol	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
2-Nitroaniline	19.00 U	19.00 U	19.00 U	19.00 U	not available	not applicable
2-Nitrophenol	19.00 U	19.00 U	19.00 U	19.00 U	not available	not applicable
3,3'-Dichlorobenzidine	19.00 U	19.00 U	19.00 U	19.00 U	not available	not applicable
3-Nitroaniline	19.00 U	19.00 U	19.00 U	19.00 U	not available	not applicable
4,6-Dinitro-2-Methylphenol	48.00 U	47.00 U	47.00 U	48.00 U	not available	not applicable
4-Bromophenyl-Phenylether	9.50 U	9.40 U	9.40 U	9.60 U	122.00	not applicable
4-Chloro-3-Methylphenol	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
4-Chloroaniline	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
4-Chlorophenyl-Phenylether	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
4-Methylphenol	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
4-Nitroaniline	19.00 U	19.00 U	19.00 U	19.00 U	not available	not applicable
4-Nitrophenol	19.00 U	19.00 U	19.00 U	19.00 U	not available	not applicable
Acenaphthene	9.50 U	9.40 U	9.40 U	9.60 U	520.00	not applicable
Acenaphthylene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Anthracene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Benzo(A)Anthracene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Benzo(A)Pyrene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Benzo(B)Fluoranthene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Benzo(G,H,I)Perylene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Benzo(K)Fluoranthene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Bis(2-Chloroethoxy)Methane	9.50 U	9.40 U	9.40 U	9.60 U	6,400.00	not applicable
Bis(2-Chloroethyl)Ether	9.50 U	9.40 U	9.40 U	9.60 U	122.00	not applicable
Bis(2-Chloroisopropyl)Ether	9.50 U	9.40 U	9.40 U	9.60 U	122.00	not applicable
Bis(2-Ethylhexyl)Phthalate	9.50 U	9.40 U	9.40 U	9.60 U	360.00	not applicable
Butylbenzylphthalate	9.50 U	9.40 U	9.40 U	9.60 U	3.40	10
Carbazole	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Chrysene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable

TABLE 3: SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID Number: Sample ID Number: Matrix: Sample Date:	GW01 04530GW001 WATER 11/26/2003	GW02 04530GW002 WATER 11/26/2003	GW02 04530GW002D WATER 11/26/2003	GW03 04530GW003 WATER 11/26/2003	AWQC <sup>a</sup> (μg/L)	PRRL (μg/L)
Semivolatile Organic Compounds (µg/L						
Dibenz(A,H)Anthracene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Dibenzofuran	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Diethylphthalate	9.50 U	9.40 U	9.40 U	9.60 U	3.00	not applicable
Dimethylphthalate	9.50 U	9.40 U	9.40 U	9.60 U	3.00	10
Di-N-Butylphthalate	9.50 U	9.40 U	9.40 U	9.60 U	3.40	not applicable
Di-N-Octylphthalate	9.50 U	9.40 U	9.40 U	9.60 U	3.00	10
Fluoranthene	9.50 U	9.40 U	9.40 U	9.60 U	16.00	not applicable
Fluorene	9.50 U	9.40 U	9.40 U	9.60 U		not applicable
Hexachlorobenzene	9.50 U	9.40 U	9.40 U	9.60 U	129.00	not applicable
Hexachlorobutadiene	9.50 U	9.40 U	9.40 U	9.60 U	9.30	10
Hexachlorocyclopentadiene	48.00 U	47.00 U	47.00 U	48.00 U	5.20	10
Hexachloroethane	9.50 U	9.40 U	9.40 U	9.60 U	540.00	not applicable
Indeno(1,2,3-Cd)Pyrene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Isophorone	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Naphthalene	9.50 U	9.40 U	9.40 U	9.60 U	620.00	not applicable
Nitrobenzene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
N-Nitrosodimethylamine	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
N-Nitroso-Di-N-Propylamine	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
N-Nitrosodiphenylamine (1)	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Pentachlorophenol	19.00 U	19.00 U	19.00 U	19.00 U	7.90	not applicable
Phenanthrene	9.50 U	9.40 U	9.40 U	9.60 U	4.60	not applicable
Phenol	9.50 U	9.40 U	9.40 U	9.60 U	2,560.00	not applicable
Pyrene	9.50 U	9.40 U	9.40 U	9.60 U	not available	not applicable
Volatile Organic Compounds (μg/L)						
1,1,1-Trichloroethane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
1,1,2,2-Tetrachloroethane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	2,400.00	not applicable
1,1,2-Trichloroethane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	9,400.00	not applicable
1,1-Dichloroethane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
1,1-Dichloroethene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
1,2-Dichloroethane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	20,000.00	not applicable
1,2-Dichloroethene (Total)	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
1,2-Dichloropropane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	3,040.00	not applicable

TABLE 3: SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID Number: Sample ID Number: Matrix:	GW01 04530GW001 WATER	GW02 04530GW002 WATER	GW02 04530GW002D WATER	GW03 04530GW003 WATER	AWQC <sup>a</sup> (μg/L)	PRRL (µg/L)
Sample Date:	11/26/2003	11/26/2003	11/26/2003	11/26/2003		
Volatile Organic Compounds (µg/L) (co						
2-Butanone	10.00 UJ	10.00 UJ	10.00 UJ	10.00 U	not available	not applicable
2-Hexanone	10.00 UJ	10.00 UJ	10.00 UJ	10.00 U	not available	not applicable
4-Methyl-2-Pentanone	10.00 UJ	10.00 UJ	10.00 UJ	10.00 U	not available	not applicable
Acetone	10.00 UJ	10.00 UJ	10.00 UJ	10.00 U	not available	not applicable
Benzene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	700.00	not applicable
Bromodichloromethane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	6,400.00	not applicable
Bromoform	1.00 UJ	1.00 UJ	1.00 UJ	1.00 U	not available	not applicable
Bromomethane	1.00 UJ	1.00 UJ	1.00 UJ	1.00 U	not available	not applicable
Carbon Disulfide	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
Carbon Tetrachloride	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	6,400.00	not applicable
Chlorobenzene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	50.00	not applicable
Chloroethane	1.00 UJ	1.00 UJ	1.00 UJ	1.00 U	not available	not applicable
Chloroform	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	1,240.00	not applicable
Chloromethane	1.00 UJ	1.00 UJ	1.00 UJ	1.00 U	not available	not applicable
Cis-1,3-Dichloropropene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
Dibromochloromethane	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	6,400.00	not applicable
Ethylbenzene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
Methylene Chloride	10.00 UJ	10.00 UJ	10.00 UJ	10.00 U	not available	not applicable
Styrene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
Tetrachloroethene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	450.00	not applicable
Toluene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	5,000.00	not applicable
Trans-1,3-Dichloropropene	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
Trichloroethene	0.60 J	0.60 J	0.50 J	0.70	not available	not applicable
Vinyl Acetate	10.00 UJ	10.00 UJ	10.00 UJ	10.00 U	not available	not applicable
Vinyl Chloride	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
Xylene (Total)	1.00 UJ	1.00 UJ	1.00 UJ	0.50 U	not available	not applicable
Total Petroleum Hydrocarbons (mg/L)						
Gasoline Range Organics	0.05 U	0.05 U	0.05 U	0.05 U	not available	not applicable
Diesel C10-C24 (sgcu)	0.10 H	0.05 U	0.05 U	0.05 UJ	not available	not applicable
Motor Oil C24-C36 (sgcu)	0.30 UJ	0.30 U	0.30 U	0.30 UJ	not available	not applicable

TABLE 3: SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID Number: Sample ID Number: Matrix: Sample Date:	GW01 04530GW001 WATER 11/26/2003	GW02 04530GW002 WATER 11/26/2003	GW02 04530GW002D WATER 11/26/2003	GW03 04530GW003 WATER 11/26/2003	AWQC <sup>a</sup> (µg/L)	PRRL (µg/L)
Groundwater Parameters						
Н	7.8	7.6	7.6	NA	not available	not applicable
Total Suspended Solids	5	38	26	NA	not available	not applicable
Total Organic Carbon	13	13	13	13	not available	not applicable
Dioxins (µg/L)						
1,2,3,4,6,7,8,9-Ocdd	NA	NA	NA	8.70E-06 UJ	not available	not applicable
1,2,3,4,6,7,8-Hpcdd	NA	NA	NA	2.00E-06 U	not available	not applicable
1,2,3,4,6,7,8-Hpcdf	NA	NA	NA	1.10E-06 U	not available	not applicable
1,2,3,4,7,8,9-Hpcdf	NA	NA	NA	1.60E-06 U	not available	not applicable
1,2,3,4,7,8-Hxcdd	NA	NA	NA	1.40E-06 U	not available	not applicable
1,2,3,4,7,8-Hxcdf	NA	NA	NA	7.50E-07 U	not available	not applicable
1,2,3,6,7,8-Hxcdd	NA	NA	NA	1.20E-06 U	not available	not applicable
1,2,3,6,7,8-Hxcdf	NA	NA	NA	7.40E-07 U	not available	not applicable
1,2,3,7,8,9-Hxcdd	NA	NA	NA	1.30E-06 U	not available	not applicable
1,2,3,7,8,9-Hxcdf	NA	NA	NA	9.00E-07 U	not available	not applicable
1,2,3,7,8-Pecdd	NA	NA	NA	1.90E-06 U	not available	not applicable
1,2,3,7,8-Pecdf	NA	NA	NA	1.00E-06 U	not available	not applicable
2,3,4,6,7,8-Hxcdf	NA	NA	NA	8.30E-07 U	not available	not applicable
2,3,4,7,8-Pecdf	NA	NA	NA	9.70E-07 U	not available	not applicable
2,3,7,8-Tcdd	NA	NA	NA	1.50E-06 U	not available	not applicable
2,3,7,8-Tcdf	NA	NA	NA	1.60E-06 U	not available	not applicable
Heptachlorodibenzo-P-Dioxins	NA	NA	NA	2.00E-06 U	not available	not applicable
Heptachlorodibenzofurans	NA	NA	NA	1.10E-06 U	not available	not applicable
Hexachlorodibenzo-P-Dioxins	NA	NA	NA	1.40E-06 U	not available	not applicable
Hexachlorodibenzofurans	NA	NA	NA	7.50E-07 U	not available	not applicable
Octachlorodibenzofuran	NA	NA	NA	5.20E-06 UJ	not available	not applicable

TABLE 3: SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID Number: Sample ID Number: Matrix: Sample Date:	GW01 04530GW001 WATER 11/26/2003	GW02 04530GW002 WATER 11/26/2003	GW02 04530GW002D WATER 11/26/2003	GW03 04530GW003 WATER 11/26/2003	AWQC <sup>a</sup> (μg/L)	PRRL (µg/L)
Dioxins (µg/L) (continued)						
Pentachlorodibenzo-P-Dioxin	NA	NA	NA	1.90E-06 U	not available	not applicable
Pentachlorodibenzofurans	NA	NA	NA	9.70E-07 U	not available	not applicable
Tetrachlorodibenzo-P-Dioxins	NA	NA	NA	1.50E-06 U	not available	not applicable
Tetrachlorodibenzofurans	NA	NA	NA	1.60E-06 U	not available	not applicable

Notes:

Results less than 10 are reported to two significant figures, and results greater than 10 are reported to three significant figures. Bold text indicates that results are above chronic AWQC.

a Screening values represent AWQC except for mercury, which is from the San Francisco Bay Basin Plan (RWQCB 1995).

AWQC Ambient water quality criteria (EPA, 2002)

"Benzene hexachloride" (Hexachlorocyclohexane) BHC

CLP Contract laboratory program

C#-C# Indicates the range in number of carbon "C" atoms in the hydrocarbon compounds detected

Dichlorodiphenyldichloroethane DDD

DDE Dichlorodiphenyldichloroethylene

DDT Dichlorodiphenyltrichloroethane

EPA U.S. Environmental Protection Agency

H Heavy end of diesel range

Hpcdd Heptachlorodibenzo-p-dioxin Heptachlorodibenzofuran

Hexachlorodibenzo-p-dioxin

Hxcdf Hexachlorodibenzofuran

ID Identification

J Estimated value

μg/L Microgram per liter

Milligram per liter mg/L

NA Not analyzed

PRRL

Ocdd Octachlorodibenzo-p-dioxin

Polychlorinated biphenyl PCB

Pentachlorodibenzo-p-dioxin

Pecdf Pentachlorodibenzofuran Project-required reporting limit

RWQCB Regional Water Quality Control Board

Silica gel clean-up method used in the analysis for these hydrocarbon compounds sgcu

Tetrachlorodibenzo-p-dioxin Tcdd

Tetrachlorodibenzofuran

Not detected, with detection limit indicated

TABLE 4: SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Sample D	mber: latrix: Depth	SB201 04530SB001 SEDIMENT 4-5 ft bgs	SB202 04530SB002 SEDIMENT 3-4 ft bgs	SB203 04530SB003 SEDIMENT 3.75-4.75 bgs	SB204 04530SB004 SEDIMENT 2-3 ft bgs	SB205 04530SB005 SEDIMENT 2-3 ft bgs	Tidal Area Ambient <sup>a</sup>	SF Bay Ambient <sup>b</sup>	ER-L°	ER-M <sup>c</sup>	PRRL <sup>d</sup>
Sample	Date:	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003					
A1 '		16,000.00	17,000.00	18,000.00	letals (mg/kg) 11,000.00	13,000.00	27,300	not available	not available	not available	not applicable
Aluminum		92.00 J	17,000.00	16,000.00	11,000.00	13,000.00	2.7,300	not available	not available	not available	not applicable
Antimony		33.00	11.00	8.70	13.00	2.90	2.2	15.6	8.20	70.00	not applicable
Arsenic Barium		2,900.00	200.00	120.00	98.00	140.00	530	not available	not available	not available	not applicable
		0.25 J	0.39 J	0.46 J	0.55	0.53	0.18	not available	not available	not available	not applicable
Beryllium Cadmium		6.10 J	1.10 UJ	0.46 J	0.31 UJ	0.33 UJ	1.9	0.33	1.20	9.60	not applicable
Chromium III		77.00	44.00	46.00	24.00	23.00	82.1	112	81.00	370.00	not applicable
Chromium VI		160.00 U	210.00 U	280.00 U	67.00 U	60.00 U	not available	not available	not available	not available	not applicable
Cobalt		9.70	4.00 J	3.90 J	8.30	9.30	36	not available	not available	not available	not applicable
		740.00	92.00	140.00	30.00	13.00	81	68.1	34.00	270.00	not applicable
Copper Lead		570.00 J	240.00 J	180.00 J	100.00 J	8.00 J	95	43.2	46.70	218.00	not applicable
Manganese		590.00	270.00	380.00	260.00	440.00	1,500	not available	not available	not available	not applicable
Mercury		0.27	0.08	0.36	0.03 UJ	0.03 UJ	0.32	0.43	0.15	0.71	not applicable
Molybdenum		7.60	3.70 J	3.30 J	1.20 U	1.30 U	6.6	not available	not available	not available	not applicable
Nickel		65.00 J	40.00 J	40.00 J	24.00 J	35.00 J	120	112	20.90	51.60	not applicable
Selenium		1.20	1.10 U	1.00 J	0.31 U	0.33 U	not available	0.64	not available	not available	not applicable
Silver		0.71 J	1.10 U	1.30 U	0.31 U	0.33 U	not available	0.58	1.00	3.70	not applicable
Thallium		3.00 J	1.10 U	1.30 U	0.46 UJ	0.33 U	2.2	not available	not available	not available	not applicable
Vanadium		72.00	55.00	63.00	34.00	26.00	96	not available	not available	not available	not applicable
Zinc		11.000.00	370.00	290.00	110.00	26.00	264	158	150.00	410.00	not applicable
Zinc					Bs (µg/kg)						
Aroclor-1016		39.00 UJ	50.00 UJ	66.00 UJ	16.00 U	14.00 U	not available	14.8	22.7	180.00	33.00
Aroclor-1221		77.00 UJ	100.00 UJ	130.00 UJ	32.00 U	29.00 U	not available	14.8	22.7	180.00	67.00
Aroclor-1232		39.00 UJ	50.00 UJ	66.00 UJ	16.00 U	14.00 U	not available	14.8	22.7	180.00	33.00
Aroclor-1242		39.00 UJ	50.00 UJ	66.00 UJ	16.00 U	14.00 U	not available	14.8	22.7	180.00	33.00
Aroclor-1248		39.00 UJ	50.00 UJ	66.00 UJ	16.00 UJ	14.00 UJ	not available	14.8	22.7	180.00	33.00
Aroclor-1254		39.00 UJ	50.00 UJ	66.00 UJ	16.00 U	14.00 U	not available	14.8	22.7	180.00	33.00
Aroclor-1260		39.00 UJ	50.00 UJ	66.00 UJ	16.00 U	14.00 U	not available	14.8	22.7	180.00	33.00

TABLE 4: SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID Number: Sample ID Number: Matrix:	SB201 04530SB001 SEDIMENT	SB202 04530SB002 SEDIMENT	SB203 04530SB003 SEDIMENT	SB204 04530SB004 SEDIMENT	SB205 04530SB005 SEDIMENT	Tidal Area Ambient <sup>a</sup>	SF Bay Ambient <sup>b</sup>	ER-L°	ER-M°	PRRL <sup>d</sup>
Sample Depth Sample Date:	4-5 ft bgs 11/24/2003	3-4 ft bgs 11/24/2003	3.75-4.75 bgs 11/24/2003	2-3 ft bgs 11/24/2003	2-3 ft bgs 11/24/2003					
			Pesti	cides (µg/kg)						
4,4'-DDD	11.00 U	14.00 U	18.00 U	4.30 U	3.90 U	not available	not available	not available	not available	not applicable
4,4'-DDE	11.00 U	14.00 U	18.00 U	4.30 U	3.90 U	not available	not available	not available	not available	not applicable
4,4'-DDT	11.00 U	14.00 UJ	18.00 UJ	4.30 UJ	3.90 UJ	not available	not available	not available	not available	not applicable
Total DDTs	ND	ND	ND	ND	ND	not available	7	1.58	46.1	not applicable
Aldrin	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Alpha-BHC	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Alpha-chlordane	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	0.5	6.0	not applicable
Beta-BHC	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Delta-BHC	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Dieldrin	11.00 U	14.00 U	18.00 U	4.30 U	3.90 U	not available	0.44	0.02	8.0	6.0
Endosulfan I	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Endosulfan II	11.00 U	14.00 U	18.00 U	4.30 UJ	3.90 U	not available	not available	not available	not available	not applicable
Endosulfan Sulfate	11.00 U	14.00 U	18.00 U	4.30 UJ	3.90 U	not available	not available	not available	not available	not applicable
Endrin	11.00 U	14.00 U	18.00 U	4.30 U	3.90 U	not available	not available	0.02	45.0	6.0
Endrin Aldehyde	11.00 U	14.00 UJ	18.00 UJ	4.30 UJ	3.90 UJ	not available	not available	not available	not available	not applicable
Gamma-BHC	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Gamma-chlordane	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Heptachlor	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Heptachlor Epoxide	5.50 U	7.10 U	9.40 U	2.20 U	2.00 U	not available	not available	not available	not available	not applicable
Methoxychlor	55.00 U	71.00 UJ	94.00 UJ	22.00 UJ	20.00 UJ	not available	not available	not available	not available	not applicable
Toxaphene	190.00 U	250.00 U	330.00 U	79.00 U	70.00 U	not available	not available	not available	not available	not applicable

TABLE 4: SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID Number:	SB201	SB202	SB203	SB204	SB205					
Sample ID Number:	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005	Tidal Area	SF Bay	ER-L <sup>c</sup>	ER-M <sup>c</sup>	$PRRL^d$
Matrix:	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	Ambient <sup>a</sup>	Ambient <sup>b</sup>			
Sample Depth Sample Date:	4-5 ft bgs 11/24/2003	3-4 ft bgs 11/24/2003	3.75-4.75 bgs 11/24/2003	2-3 ft bgs 11/24/2003	2-3 ft bgs 11/24/2003					
Campio Bato:	11/2-1/2000	11/21/2000		OCs (ug/kg)	11/2-1/2000					
1,2,4-Trichlorobenzene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
1,2-Dichlorobenzene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
1,3-Dichlorobenzene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
1,4-Dichlorobenzene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2,4,5-Trichlorophenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2,4,6-Trichlorophenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2,4-Dichlorophenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2,4-Dimethylphenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2,4-Dinitrophenol	5,300.00 U	6,900.00 U	9,200.00 U	2,200.00 U	2,000.00 U	not available	not available	not available	not available	not applicable
2,4-Dinitrotoluene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2,6-Dinitrotoluene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2-Chloronaphthalene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2-Chlorophenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2-Methylnaphthalene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	19.4	70	670	not applicable
2-Methylphenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
2-Nitroaniline	2,100.00 U	2,800.00 U	3,700.00 U	890.00 U	800.00 U	not available	not available	not available	not available	not applicable
2-Nitrophenol	2,100.00 U	2,800.00 U	3,700.00 U	890.00 U	800.00 U	not available	not available	not available	not available	not applicable
3,3'-Dichlorobenzidine	2,100.00 U	2,800.00 U	3,700.00 U	890.00 U	800.00 U	not available	not available	not available	not available	not applicable
3-Nitroaniline	2,100.00 U	2,800.00 U	3,700.00 U	890.00 U	800.00 U	not available	not available	not available	not available	not applicable
4,6-Dinitro-2-Methylphenol	5,300.00 U	6,900.00 U	9,200.00 U	2,200.00 U	2,000.00 U	not available	not available	not available	not available	not applicable
4-Bromophenyl-Phenylether	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
4-Chloro-3-Methylphenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
4-Chloroaniline	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
4-Chlorophenyl-Phenylether	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
4-Methylphenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
4-Nitroaniline	2,100.00 U	2,800.00 U	3,700.00 U	890.00 U	800.00 U	not available	not available	not available	not available	not applicable
4-Nitrophenol	2,100.00 U	2,800.00 U	3,700.00 U	890.00 UJ	800.00 U	not available	not available	not available	not available	not applicable
Acenaphthene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	26.6	16	500.00	330.00
Acenaphthylene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	31.7	44	640	330
Anthracene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	88	85.3	1100	not applicable
Benzo(A)Anthracene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	244	261	1600	330
Benzo(A)Pyrene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	412	430	1600	not applicable
Benzo(B)Fluoranthene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	not available	not available	not available	not applicable
Benzo(G,H,I)Perylene	210.00 UJ	280.00 UJ	370.00 UJ	89.00 UJ	80.00 UJ	not available	not available	not available	not available	not applicable

TABLE 4: SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID Number:	SB201	SB202	SB203	SB204	SB205					
Sample ID Number:	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005	Tidal Area	SF Bay	ER-L <sup>c</sup>	ER-M <sup>c</sup>	PRRL <sup>d</sup>
Matrix: Sample Depth	SEDIMENT 4-5 ft bgs	SEDIMENT 3-4 ft bgs	SEDIMENT 3.75-4.75 bgs	SEDIMENT 2-3 ft bgs	SEDIMENT 2-3 ft bgs	Ambient <sup>a</sup>	Ambient <sup>b</sup>			
Sample Depth Sample Date:	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003					
Benzo(K)Fluoranthene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	not available	not available	not available	not applicable
Bis(2-Chloroethoxy)Methane	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Bis(2-Chloroethyl)Ether	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Bis(2-Chloroisopropyl)Ether	1,100.00 U	1,400.00 U	1,800.00 U	450.00 UJ	400.00 U	not available	not available	not available	not available	not applicable
Bis(2-Ethylhexyl)Phthalate	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Butylbenzylphthalate	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Carbazole	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Chrysene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	289	384	2800	not applicable
Dibenz(A,H)Anthracene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	32.7	63.4	260	330
Dibenzofuran	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Diethylphthalate	210.00 UJ	280.00 UJ	370.00 UJ	89.00 UJ	80.00 UJ	not available	not available	not available	not available	not applicable
Dimethylphthalate	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Di-N-Butylphthalate	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Di-N-Octylphthalate	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Fluoranthene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	not available	600	5,100.00	not applicable
Fluorene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	25.3	19	540	330
Hexachlorobenzene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Hexachlorobutadiene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Hexachlorocyclopentadiene	5,300.00 UJ	6,900.00 UJ	9,200.00 UJ	2,200.00 UJ	2,000.00 UJ	not available	not available	not available	not available	not applicable
Hexachloroethane	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Indeno(1,2,3-Cd)Pyrene	210.00 UJ	280.00 UJ	370.00 UJ	89.00 UJ	80.00 UJ	not available	not available	not available	not available	not applicable
Isophorone	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Naphthalene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	55.8	160	2,100.00	330.00
Nitrobenzene	1,100.00 U	1,400.00 U	1,800.00 U	450.00 UJ	400.00 U	not available	not available	not available	not available	not applicable
N-Nitrosodimethylamine	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
N-Nitroso-Di-N-Propylamine	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	not available	not available	not available	not applicable
N-Nitrosodiphenylamine (1)	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Pentachlorophenol	2,100.00 U	2,800.00 U	3,700.00 U	890.00 U	800.00 U	not available	not available	not available	not available	not applicable
Phenanthrene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	237	240	1,500.00	330.00
Phenol	1,100.00 U	1,400.00 U	1,800.00 U	450.00 U	400.00 U	not available	not available	not available	not available	not applicable
Pyrene	210.00 U	280.00 U	370.00 U	89.00 U	80.00 U	not available	655	665	2600	not applicable

## TABLE 4: SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID Number:	SB201	SB202	SB203	SB204	SB205					
Sample ID Number:	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005	Tidal Area	SF Bay	ER-L <sup>c</sup>	ER-M <sup>c</sup>	PRRL <sup>d</sup>
Matrix: Sample Depth	SEDIMENT 4-5 ft bgs	SEDIMENT 3-4 ft bgs	SEDIMENT 3.75-4.75 bgs	SEDIMENT 2-3 ft bgs	SEDIMENT 2-3 ft bgs	Ambient <sup>a</sup>	Ambient <sup>b</sup>			
Sample Date:	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003					
			Total Petroleum	Hydrocarbons (mg	g/kg)					
Gasoline range organics	3.40 U	4.50 U	5.70 U	1.40 U	1.20 U	not available	not available	not available	not available	not applicable
Diesel C10-C24 (sgcu)	12.00 H	18.00 H	23.00 H	1.30 UJ	1.20 UJ	not available	not available	not available	not available	not applicable
Motor Oil C24-C36 (sgcu)	47.00 M	63.00 M	110.00 M	17.00 M	6.10 M	not available	not available	not available	not available	not applicable
				ent Parameters						
рН	7.30	7.50	7.10	8.20	8.1	not available	not available	not available	not available	not applicable
Total Organic Carbon	110,000.00	180,000.00	290,000.00	600.00	1,600	not available	not available	not available	not available	not applicable
122467000 11	NIA	NIA		xins (µg/kg)	NI A	not available	not available	not available	not available	not applicable
1,2,3,4,6,7,8,9-Ocdd	NA	NA	0.0139 J	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,4,6,7,8-Hpcdd	NA	NA	0.0022	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,4,6,7,8-Hpcdf	NA	NA	0.0053	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,4,7,8,9-Hpcdf	NA	NA	0.0005 U	NA	NA	not available	not available	not available		not applicable
1,2,3,4,7,8-Hxcdd	NA	NA	0.0004 U	NA	NA	not available	not available	not available	not available	
1,2,3,4,7,8-Hxcdf	NA	NA	0.0022	NA	NA					not applicable
1,2,3,6,7,8-Hxcdd	NA	NA	0.0003 U	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,6,7,8-Hxcdf	NA	NA	0.0010	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,7,8,9-Hxcdd	NA	NA	0.0003 U	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,7,8,9-Hxcdf	NA	NA	0.0003 U	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,7,8-Pecdd	NA	NA	0.0004 U	NA	NA	not available	not available	not available	not available	not applicable
1,2,3,7,8-Pecdf	NA	NA	0.0003 U	NA	NA	not available	not available	not available	not available	not applicable
2,3,4,6,7,8-Hxcdf	NA	NA	0.0012	NA	NA	not available	not available	not available	not available	not applicable
2,3,4,7,8-Pecdf	NA	NA	0.0010	NA	NA	not available	not available	not available	not available	not applicable
2,3,7,8-Tcdd	NA	NA	0.0003 U	NA	NA	not available	not available	not available	not available	not applicable
2,3,7,8-Tcdf	NA	NA	0.0012	NA	NA	not available	not available	not available	not available	not applicable
Dioxin TEQ	NA	NA	0.0011	NA	NA	not available	not available	not available	not available	not applicable
Heptachlorodibenzo-P-Dioxins	NA	NA	0.0042	NA	NA	not available	not available	not available	not available	not applicable
Heptachlorodibenzofurans	NA	NA	0.0053	NA	NA	not available	not available	not available	not available	not applicable
Hexachlorodibenzo-P-Dioxins	NA	NA	0.0008	NA	NA	not available	not available	not available	not available	not applicable
Hexachlorodibenzofurans	NA	NA	0.0032	NA	NA	not available	not available	not available	not available	not applicable
Octachlorodibenzofuran	NA	NA	0.0019 UJ	NA	NA	not available	not available	not available	not available	not applicable
Pentachlorodibenzo-P-Dioxin	NA	NA	0.0004 U	NA	NA	not available	not available	not available	not available	not applicable
Pentachlorodibenzofurans	NA	NA	0.0145	NA	NA	not available	not available	not available	not available	not applicable
Tetrachlorodibenzo-P-Dioxins	NA	NA	0.0003 U	NA	NA	not available	not available	not available	not available	not applicable
Tetrachlorodibenzofurans	NA	NA	0.0239	NA	NA	not available	not available	not available	not available	not applicable

#### TABLE 4: SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Remedial Investigation Addendum Report for the Taylor Boulevard Bridge (Site 30), NWS SBD Concord, Concord, California

Point ID Number:	SB201	SB202	SB203	SB204	SB205					
Sample ID Number:	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005	Tidal Area	SF Bay	ER-L <sup>c</sup>	ER-M <sup>c</sup>	$PRRL^{d}$
Matrix:	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	Ambient <sup>a</sup>	Ambient <sup>b</sup>			
Sample Depth	4-5 ft bgs	3-4 ft bgs	3.75-4.75 bgs	2-3 ft bgs	2-3 ft bgs					
Sample Date:	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003					

Notes:

Bold red numerals indicate sediment concentration greater than the high benchmark value (ER-M set as the high benchmark value)

Bold blue numerals indicate sediment concentration greater than the low benchmark value (low benchmark value = SF Bay Ambient or ER-L value, whichever is greater)

bgs	Below ground surface	Hpcdf	Heptachlorodibenzofuran	PCB	Polychlorinated biphenyls
BHC	"Benzene hexachloride" (Hexachlorocyclohexane)	Hxcdd	Hexachlorodibenzo-p-dioxin	Pecdd	Pentachlorodibenzo-p-dioxin
CLP	Contract laboratory program	Hxcdf	Hexachlorodibenzofuran	Pecdf	Pentachlorodibenzofuran
DDD	Dichlorodiphenyldichloroethane	J	Estimated	PRRL	Project-required reporting limit
DDE	Dichlorodiphenyldichloroethylene	ID	Identification	RWQCB	Regional Water Quality Control Board
DDT	Dichlorodiphenyltrichloroethane	M	Motor oil range	SF	San Francisco
ER-L	Effects Range-Low	μg/kg	Microgram per kilogram	SVOC	Semivolatile organic compounds
ER-M	Effects Range-Median	mg/kg	Milligram per kilogram	Tcdd	Tetrachlorodibenzo-p-dioxin
ft	Feet	NA	Not analyzed	Tcdf	Tetrachlorodibenzofuran
Н	Heavy end of diesel range	Ocdd	Octachlorodibenzo-p-dioxin	TPH	Total petroleum hydrocarbons
Hpcdd	Heptachlorodibenzo-p-dioxin	PAH	Polynuclear aromatic hydrocarbons	TEQ	Total equivalents of 2378-TCDD activity
				U	Not detected, with detection limit indicated

C#-C# Indicates the range in number of carbon "C" atoms in the hydrocarbon compounds detected sqcu Silica gel clean-up method used in the analysis for these hydrocarbon compounds

Toxic equivalence (TEQ) was calculated for dioxins following World Health Organization (WHO) (1997).

For all calculations of TEQ, zero was substituted for nondetected congeners.

van Leeuwen, FXR. (1997). "Derivation of Toxic Equivalency factors (TEFs) for PCBs, PCDDs, and PCDFs in humans and wildlife."

a Tetra Tech. 2002. "Draft Final Remedial Investigation for Taylor Boulevard Bridge Disposal Site, Tidal Area, NWS SB, Detachment Concord, Appendix E." January 31.

b RWQCB. 1998. "Ambient Concentrations of Toxic Chemicals in Sediments." April.

c Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. "Incidence of Adverse Biological Effects within Ranges Of Chemical Concentrations in Marine and Estuarine Sediments." Environmental Management. Volume 19. Number 1. Pages 81-97.

d Tetra Tech. 2003. "Draft Final Sampling and Analysis Plan, Additional Remedial Investigation for the Taylor Boulevard Bridge (Site 30) and the Tidal Area Landfill (Site 1), NWS SB, Detachment Concord." April 19.

TABLE 5: COMPARISON OF FIELD DUPLICATE RELATIVE PERCENT DIFFERENCE

Analyte	GW02 Original ( μg/L)	GW02 Field Duplicate ( µg/L)	Relative Percent Difference (%)
Aluminum	1,100	( <b>μg</b> / <b>L</b> ) 560	65
Antimony	36 UJ	60 U	incalculable*
Arsenic	37 J	34 J	8.5
Barium	37	32	14
Beryllium	2 U	2 U	incalculable*
Cadmium	5U	5 U	incalculable*
Calcium	30,000	29,000	3.4
Chromium	10 U	10 U	incalculable*
Chromium VI	10 U	10 U	incalculable*
Cobalt	20 U	20 U	incalculable*
Copper	3.4	3.7	8.5
Iron	1,100	570	63.5
Lead	3 U	3 U	incalculable*
Magnesium	53000 J	51000 J	3.9
Manganese	300 J	290 J	3.4
Mercury	0.21	0.24	13.3
Molybdenum	92	90	2.2
Nickel	17	17	0
Potassium	42,000 J	41,000 J	2.4
Selenium	5 U	5 U	incalculable*
Silver	5 U	5 U	incalculable*
Sodium	1,600,000	1,700,000	6.1
Thallium	3.9 J	5 U	incalculable*
Vanadium	18	16	11.8
Zinc	21	13J	47.1

### Notes:

J Estimated

U Nondetect (value shown is the detection limit)

μg/L Micrograms per liter

<sup>%</sup> Percent

<sup>\*</sup> Relative percent difference incalculable due to nondetect

APPENDIX A PHOTOGRAPHS



Photograph 1: Taylor Boulevard Bridge Disposal Site (Site 30) looking northwest from the southeast corner of the site



Photograph 2: Taylor Boulevard Bridge Disposal Site (Site 30) looking west from the center of the site



Photograph 3: Field crew installing groundwater monitoring well GW03



Photograph 4: Groundwater monitoring well installation and soil logging of the well boring at well GW01 (looking northeast)



Photograph 5: Groundwater monitoring well GW02 looking northwest across Seal Creek Marsh

APPENDIX B FIELD NOTES

### CONTENTS

Field Logbook No	old Paedpaul tit				
Name	Location				
(Continued from previous p	page)				
Project	Last Page Notes Taken Used				
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No.	Date	×			
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No.	Date				
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No.	Date				
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No.	Date				
Name	Name				
No.	Date				
Name	Name				

Field Logbook No. Date 10/22/\$3
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0845 Leave Page 200 don Taylor
Boltound Bridge (TBB)
0920 Annive at Taylor BB
Personnel on Site!
Lucinda Rosa TIEMZ
Jerry Wicthen THEMI
David Courl Processon Sumply
Formando Ambrez Precesson Sompler
Roborto Estrada Prococou Semphus
Monitoring points to be installed as
temporary points for groundered on
grade samplings Stock trachla of U.S.
Many called Lucinda Rose and relaxed
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USEPA that requested the wells be
mue permanent well
13

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Date 10/22/03 Field Logbook No. Field Logbook No. Project No. Project No. Project Name Taylor BA Sampling water Bow enums Bridge 22

Project Name Taylor BB Samp dobus that has could into the lok From above stopped 25' 23

Field Logbook No. Project No. Taylor BB Sumpling Project Name SEZ03 O = 1.51 Dent grounds gray Grand with glassand brick I has monte fruit wet organia eders or BB Sumply 24

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PERSONNA ONSITE FOR SAMPLING:

EUGENE TAPALLA - PERCISION SAMPLING

DAVID COWELL - PERCISION SAMPLING

PAT CALLAHAN - TTEMI

POY GLENN - TTEMI

0030 WAITING FOR SELVEITY TO OPEN GATE PUZZ TO SITE.
1030 SECURITY FINALLY FINDS KEYS TO SITE AND OPENS GATE.
1045 SETTING UP FOR SOMPLING

1/20 [SB205] BOREHOVE WAS PREVIOUSLY OPENED AND HAS CLOSED
AT 2.0 At byp. AUGERING HOLE TO PREVIOUS UNDISTURBED
SOIL AT DEPTH OF 2 10 ft.

1145 CALLET JERRY WICKHAM HE WAS UNSWEE ABOUT THE SAMPLE DEPTH OF BORING, OR REASON FOR SOMPLING PUTING TO 10-FT.

BASED ON FSP, SOIL SAMPLES ARE TO BE COLLECTED G-IN TO

1- FA BELOW THE BOTTOM OF THE DEBRIS. GROWG TO DELOCATED NEW BORING ADJACENT TO THE PREVIOUS BURING.

1205 COLLECTED SOIL SAMPLES \$453\$SBQ\$5. COLLECTED 4-802

JANS. NO 1602 JANS ON ENCORE SAMPLEDIG CONTAINERS

LEDRE DELIVERED BY THE LAB. SAMPLE DEPTH 1.0-2.0 \$4 lage

NO HEW SAMPLE BORING LOG, USE PREVIOUS LOG.

1245 WHEH

1370 BARK AT STE. PICKED UP 4-INCH PUC PIPE FOR SAMPLING IN MARSA. THE CO-INCH PIPE THAT PRECISION HAD WAS TOO BIG FOR SOMPLING.

1345 SB203) STARTING BORING.

1490 COLLEGED SOIL SOMPLE \$45305B\$03 FROM 3.75 to 4.75 fd byp.
FILL MATERIAL & DEBRIS TO 3.5 fd byp. COLLEGED G-802 JARS.

1448 SBZOZ STARTING TO AUGUR SOMPLE LOCATION. 1510 COLLECTED SIL SOMPLE 045305BOOZ FROM 30 TO 4.0 for bys. 5 JARS 1520 SBZOI STARTING TO AGGIVE SOMPLE WEATION. SAMPLING METHOD IS TO DRIVE/HAMMER A 4" PUC PIPE ~ 1 44 INTO THE GROUND THEN REMOVE THE SOIL INSTOE THE PIPE WITH A HAND AVERE THEN THE PIPE IS HAMMERED ANOTHER FOOT HATE THE AND THE DIL 15 REMOVED UNTIL THE BOTTOM OF THE DUBRIS IS FOUND. THEN THE SOIL BELOW THE DEBRIS IS SAMPLED. THIS SOIL IS ORGANIC AND IS COMPLETED SATURATED 1535 COLLEGED STIL SAMPLY 045305BOOT FROM 4. \$ +0 5.\$ ft bgs. 5 Jans, A OV TO HT HOSE TH 3.02 1540 CAR WHIT CINDS ROSE CONCERNING ENCORE SOMPLING: LAB DID NOT FURNISH ENCORES SAMPLERS. SOL 15 NOT UNDISTURBBED, DID NOT HAVE DIRECT PUSH SAMPLER TO COLUEUT AN UNDISTURBED SOIL SAMPLE. THE HAMD AUGOR CAN NOT COLLECT A UNDISTURBED SAMPLE, HO SOIL SAMPLES FOR TPHP WILL NOT BE SUBMITTED FOR EN CORE ANALYSIS, STONES STONES SON SON SON 1545 [SB204] STARTING TO AUGUR SOMPLY LOCATION. 1610 COLLETED SOR SAMPLE \$45345BOOK FROM 2.4 TO 3.0 99 bys. 4 JARS 1630 DRILLERS OFF-SITE FOR THEIDAY. PREPIRG SAMPLES FOR SHIPMENT TO LAB. 1745 GOING TO FEDEY.

TAYLOR BLUD BRIDGE - SITE 30 - CONCORD NWS 11-25-03

0830 MEETING P. CALLHAN & K. EARNST AT JELLARY STATES.
0900 PERCISION ONSITE TO INSTALL PROTECTIVE CASING/BOXES
AROUND THE SMALL DIAMETER "WELLS".

1000 PUMPED 12 LITERS FROM THE WELL, FEMORED A LOT OF SAKAD AND SILT FROM THE BOTTOM OF THE WELL.

1100 WELL GWGZ. STANTING TO DEVELOP WELL.

PURGO WATER AT EMD WAS VERY CLEAR.

1240 FINISHED DEVEROPING WELL. PURCED 25 Litters

1255 WELL GWQ3. STARTING TO DEUSOF WELL.

1405 FINISHED DEVELOPINA WERE, POMPED 23 LITERS.

1430 WNCH

1505 SETTING UP EQUIPMENT TO COLLECT A WATER SAMPLE STAPLE
AT GWOBS. HAVE TO COLLECT A WATER SAMPLE AT THIS
COCATION TODAY SO THAT THE DIOXIN CAN BE FEDER
TO TEXAS OWERNIGHT.

1527 BEGIN SAMPLING GWOS

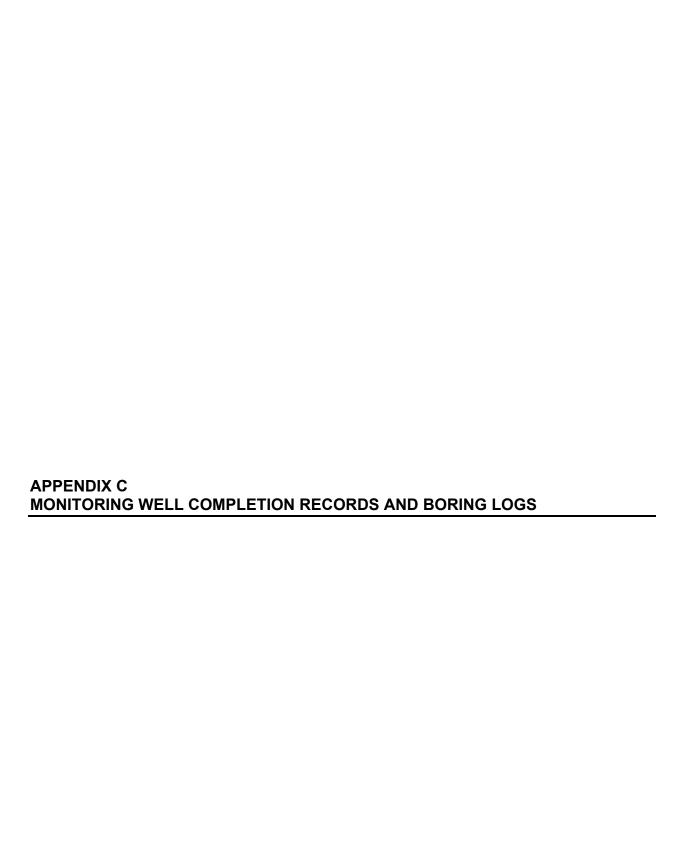
1700 FINISH SAMPLING GWOS. SAMPLE ID: 4453WGWOOS

1730 FINISHOS PACKING UP STE. PREPARING COOLERS FOR

1845 FINISHOS FOR THE Day.

2 Der

TAYLOR BUD BRIDGE - SITE 30- CONLORD NWS 11-26-03 CLAYLOR FRIDGE - SITE SO CONGRO WING 1/25-03 0800 VELIVERED CYT WATER SOMPLES IN BERKELLY. 0915 CHECK IN AT SECURITY OFFICE. 9023 FINALLY ONSTEE 0935 SETTING UP AT GWOI FOR GW SAMPLING 1006 STARTING TO SAMPLE 1120 FINISHO SOMRING, SOMPLE ID: 045306WOQ1 1/26 STARTING TO SAMPLE GWOZ 1340 FINISHOD SAMPLING, SAMPLE ID: 045306WOOZ AND 64530GWOOZD (DURICATE) 1455 PACKED UP ALL THE EQUIPMENT SUPPLIES, AND SOMPLES. 465 FREEDRICK DEVELOPMENT GERGY LEAVING SITE TO PROP SAMPLES FOR LAB. 1610 PATRICK CAUSHAN TO CET TO DELICER SAMPLES 1645 DERNOON PERTAL EWIPMONT BACK TO EQUIPED IN GONGORO





DO:

Bldg./Site: Concord NWS - Site 30

	· · · · · · · · · · · · · · · · · · ·
Boring Number: GWØ1	Date Started: (0/22/03
Drilling Method: (Circle one) HSA Continuous Core/Direct Push/Hand	Date Completed: 10/22/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: J. Wickham
Outer Diameter of Boring: 3 1/4 11	Drilling Subcontractor: Precision Sampling
Inner Diameter of Well Casing: 13/16	Driller: David Cowell
Depth to Water (ft./bgs.) ~ 8 FEET	Location Sketch:
MARSH/WATER	o Gwell

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dla.	Description	USCS soil symbol	Well construction	OVM (ppm)
		-	-			Dark yellowish brown Silty Clay (CL);  moist; mothed; stiff; minor	cı		-
	4		-			amount of gravel.			-



DO:

Bldg./Site: Concord NWS-Site 30

						Project Name:	10		
Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dia.	Description	USCS soil symbol	Well construction	ОVМ (ррш)
	4	-				Light greenish gray Silty Clay  (CL); met; slight mottling;  minor amount of gravel;  very stiff.	CL	•	-
	- (2		-		-	Total depth = 13 ft bgs			

DQ:

Bldg./site: Concord NWS-Site 30

	Troject Hame: 100
Boring Number: GW # 2	Date Started: 10/22/03
Drilling Method: (Circle one) HSA Continuous Core/Direct Push/hand	Date Completed: 10/22/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: J. Wickham
Outer Diameter of Boring: 3/4 1	Drilling Subcontractor: Precision Sampling
Inner Diameter of Well Casing: 13/16	Driller: David Cowell
Depth to Water (ft./bgs.) ~4 FEET	Location Sketch:
MARSH/WATER	GW\$Z

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
						Dark brown Silty Clay (cl.); loose; moist; no debris.	CL		
						Gray Silty Clay (CL); stiff; yellow brown nottling; root fibers; no debris; becomes softer at about 5'; moist to wet at about 4 to 7!	CL		-



DO: Bldg./Site: Concord NWS-Site30

						Project Name: \	עט	,	
Time	Depth (ft) bgs	Drive Interval	Recovered interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dla.	Description	USCS soil symbol	Well construction	OVM (ppm)
	- - - - - -		-			Light greenish gray Silty Clay (CL);			-
	8	-	_			Light greenish gray Silty Clay (cl); wet; some mottling; low plasticity; minor amount of pebbles.  Very stiff.			
	12 -				_	Total depth = 11.5-ft bgs		_	



Sheet 1 of 2

DO:
Bldg./Site: Concord NNS-Site30

	·
Boring Number: CW43	Date Started: w2463
Drilling Method: (Circle one) HSA Continuous Core/Direct Push/Hand	Date Completed: 10/22/03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: J. Wickham
Outer Diameter of Boring: 3 1/4	Drilling Subcontractor: Precision Sampling
Inner Diameter of Well Casing: 13/16	Driller: David Cowell
Depth to Water (ft./bgs.) ~ 3 FEET	Location Sketch:
	· 6m43

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dla.	Description	USCS soil symbol	Well construction	OVM (ppm)
						Dark brown Sitty Clay (CL); luose; dry to moist; contains glass shards.	CL		
		-	-			Gray Silty Clay (CH); moist; soft; highly plastic; some dark brown organic inclusions and mottling; no debris.	СН		-
		-				Gray Sitty Clay (CH); wet at about 3.0'; soft; highly plastic; yellowish brown mottling.	СН		-



Bldg./Site: Concurd NWS - Site 30

						Project Name.			
Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
	7					Light greenish gray Silty Clay (CL); moist; low plasticity; no mottling; scattered miner amount of small pebbles.	CL	-	-
						9-10.2] Light greenish gray fine to medium sand (SP); minor amount of clay; grades to Clayey Sand (SC) at about 10!.  Light greenish gray Sitty Clay (W); low to moderate plasticity; stiff; minor amount of gravel.	sP/ sc		
						Total depth = 12.5 ft bgs		- -	



## MONITORING WELL COMPLETION RECORD

DRUBING MONTO PROJUCT LOCATE DEPTH BOS  DEPT	MONITORING WELL	SURFACE COMPLETION SERVING	SURVEY INFORMATION
PROJECT: Laydor Dis Concern River  BORRENCE NOT: COUNTY THE CONCERN RIVER  BORRENCE NOT COUNTY THE COUNTY THE ROLL TO CONCERN RESPONDED  DRILLING INFORMATION SEED  DRILLING INFORMATIO	BESSESSES MONITORING WELL	☐ FLUSH MOUNT	TOC ELEVATION:
DOUBLING BEST NO.  TOCTO BOTTOM OF WELL:  LAT 107  TOCTO CASHOD  T	MONITORING WELL NO .: 6000	AABOVE GROUND WITH BUMPER POST	
DIRECTION OF WELL STATE OF A CASH ON DIRECTION OF WELL STATE OF A CASH ON DIRECTION OF WELL STATE OF A CASH ON STATE OF A CASH	PROJECT: (aylor BB Schupling	CONCRETE C ASPHALT	
WELL PERMIT NO.  TOCTO TO BOTTOM OF WELL:    Color   Cashid   Cashid   Color   Cashid   Color   Cashid   Color   Cashid   Color   Cashid   Cashi	SITE: 30 CONCORD TOWN	Le de la che de de con	EASTING:
DRILLING INFORMATION SECURITY  DATE LITZLES TIME  WELL INSTALLATION BEGAN.  DATE LITZLES TIME  WELL INSTALLATION BEGAN.  DATE LITZLES TIME  UNITED STALLATION BEGAN.  DATE LITZLES TIME	BOREHOLE NO.: 6000		
DRILLING INFORMATION SECURITY  DATE LITZLES TIME  WELL INSTALLATION BEGAN.  DATE LITZLES TIME  WELL INSTALLATION BEGAN.  DATE LITZLES TIME  UNITED STALLATION BEGAN.  DATE LITZLES TIME	WELL PERMIT NO.:	10/24/43	SURVEY CO.:
DRILLING INFORMATION BEGINN DATE LIZE AS TIME WELL INSTALLATION PRINSHED DATE LIZE AS TIME WELL INSTALLATION PRINSHED DATE LIZE AS TIME PORTLAND CEMBRIT:  DATE LIZE AS TIME  BRILLING THAT PRINSHED DATE LIZE AS TIME  PORTLAND CEMBRIT:  DRILLING REPORT PRINSHED DATE LIZE AS TIME  PRODUCT:  MICHON STEM AUGER  DRILLING REPORT AND CEMBRIT:  DRILLING METHOD  HOLLOW STEM AUGER  DAMETER OF AUGERS  DAMETER OF AUGERS  DEPTH BOS  DEPTH	TOC TO BOTTOM OF WELL:		
DRILLING INFORMATION BEGINN DATE LIZE AS TIME WELL INSTALLATION PRINSHED DATE LIZE AS TIME WELL INSTALLATION PRINSHED DATE LIZE AS TIME PORTLAND CEMENT:  DRILLING PRINSHED DATE LIZE AS TIME  PORTLAND CEMENT:  DRILLING PRINSHED DATE LIZE AS TIME  PORTLAND CEMENT:  DRILLING PRINSHED DATE LIZE AS TIME  PORTLAND CEMENT:  DRILLING WATER		7211	ANNULAR SEAL SESSESSES
DRILLING BEGAN  DATE LITZEAS TIME:  WELL INSTALLATION BEGAN  DATE LITZEAS TIME:  WELL INSTALLATION PRINCHED  DRILLING CO. TAYLOLD SALVANIA  DRILLING METHOD.  DRILLING METHOD.  DRILLING METHOD.  DRILLING METHOD.  DATE LITZ CO. TAYLOLD CO. TAYLOLD CO. TAYLOLD CO. THEME  DIAMETER OF AUGERS  DIAMETER OF AUGERS  DEPTH 808  DEPTH 80	MINISTRUM DRILLING INFORMATION		
DATE LITZLES TIME:  WELL INSTALLATION BREAM: DATE LITZLES TIME:  PORTLAND CORRESS.  PORTL	DRILLING BEGAN:		AMOUNT USED:
WELL MSTALLATION BEGAN  DATE WIZE VAS TIME  WELL MSTALLATION SINSHED  DATE WIZE VAS TIME  DRILLING CO. TYSISCILL SUNDAWS  DEPTH 808  DEP	DATE: LIZZIOS TIME:	1900	C CROUT FORMULA (PERCENTAGES)
DATE LITEDATE TIME  WELL INSTALLATION FINISHED:  DATE LITEDATE TO DESCRIBE SAMPLING STORM STALLED:  DRILLING ON DESCRIBE SAMPLING STORM STALLED:  DRILLING ON STEEM AUGER  DRILLING ON STEEM AUGER  DRILLING METHOD:  DRILLING METHO	WELL INSTALLATION BEGAN:	00000000	
WELL MSTALLATION FINISHED  DRILLING CO. TYSISCH DESTRUCTION  DRILLING MSTHOD.  DRILLING MSTHOD	DATE: U/22/63 TIME:		
DATE	WELL INSTALLATION FINISHED:	10000	
DRILLING CO: Preset to Several  DRILLING CO: Preset to Several  DRILLING METHOD  DRILLING METHOD  DRILLING STEMAUGER  DARROTARY  DOTHER HOND STEMAUGER  DOWNER OF AUGERS  ID: OD: 314  DEPTH BOS  DEPT	DATE: 11/22/03 TIME:	000	
DRILLING METHOD INSTALLED:  DRILLING METHOD:  DRILLING METHOD:  DRILLING METHOD:  DRILLING METHOD:  DRILLING METHOD:  DOWNED	DRILLING CO .: Procision Servicting	DEPTH BGS	
DRILL RICE: No. 4 QUALANT  DRILLING METHOD INSTALLED:  DOUBLE NO. 5 No. 6 QUALANT  DRILLING METHOD STEM AUGER  DAM ROTARY  ACTIVER: NO. 00 S.V. 1 DEPTH BOS  DEPTH BO	DRILLER: David Cowell		1
DRILLING METHOD:    HOLLOW STEM AUGER   OTHER:   DARROTARY   MOTHER OF AUGERS   ID: OD 31/4   OLD THEME   OLD THEM	LICENSE:		
DRILLING METHOD:    HOLLING STEM AUGER    DAY ROTARY		(Sec.)	□ POURED □ TREMIE
DARRETER OF AUGERS:  ID:  OD:  OD:  OD:  OD:  OD:  OD:  OD			
DIAMETER OF AUGERS  ID:  OD:  OD:  OD:  OD:  OD:  OD:  OD:			
DIAMETER OF AUGERS  ID: OD: 3 1/4  DEPTH 8GS  WELL CASING  DEPTH 8GS  DEPTH 8	☐ AIR ROTARY		
DIAMETER OF AUGENS  ID:  OD:  SYA 4  WELL CASING BOOLD  DEPTH 863  WELL SCREEN  DEPTH 863  DEPTH 86			BENTONITE SEAL
WELL CASING  DEPTH BGS  DEPTH BGS	DIAMETER OF AUGERS:		VOLUME CALCULATED: ~ 6.05 CUST
WELL CASING  DEPTH BGS  DEPTH BGS	ID: OD:		AMOUNT USED: 40.07047
WELL CASING  DEPTH BGS  DEPTH BGS		The same	
DEPTH BGS	TO THE PERSON OF		MICHIPS, SIZE: Wedium 3(8"
PRODUCT:  MFG. BY:  LENGTH OF CASING:  DEPTH BGS  DEPTH		1-11	
PRODUCT:  MFG. BY:  LENGTH OF CASING:  DEPTH BGS  DEPTH	SCHEDULE 40 PVC	DEPTH BGS	PRODUCT: Hale Plus
PRODUCT: The Local Country of the product of the pr	GOTHER:		MFG. BY: Ranged
MFG. BY:  CASING DUMETER:  OC.  DEPTH BGS  D	PRODUCT: Tri-Loc Casing	211	METHOD INSTALLED:
CASING DIAMETER OD:  DEPTH BGS  WELL SCREEN  DEPTH BGS  WELL SCREEN  DEPTH BGS  WELL SCREEN  DEPTH BGS  WELL SCREEN  DEPTH BGS  FILTER PACK  PREPACKED FILTER  VOLUME CALCULATED:  AMOUNT USED:  DEPTH BGS  METHOD INSTALLED:  DEPTH BGS  DEPTH BG	MFG. BY: Boot Lang	DEPTH BGS	EXPOURED TREMIE
MELL SCREEN  MELL SCREEN  MELL SCREEN  MELL SCREEN  METHOD INSTALLED:    DEPTH BGS   DEPTH BGS      DEPTH BGS   DEPTH BGS      MOUNT CALCULATED:   AMOUNT USED:   DEPTH BGS     DEPTH BGS   DEPTH BGS      METHOD INSTALLED:   DEPTH BGS     DEPTH BGS   DEPTH BGS      METHOD INSTALLED:   DEPTH BGS     DEPTH BGS   DEPTH BGS     DEPTH	CASING DIAMETER: CYCL		☐ OTHER:
WELL SCREEN  DEPTH BGS  DEPTH BGS  DEPTH BGS  DEPTH BGS  DEPTH BGS  DEPTH BGS  FILTER PACK  PREPACKED FILTER  VOLUME CALCULATED:  AMOUNT USED:  DEPTH BGS  METHOD INSTALLED:  DEPTH BGS  DEPTH BGS  DEPTH BGS  DEPTH BGS  FILTER PACK  PREPACKED FILTER  VOLUME CALCULATED:  AMOUNT USED:  DEPTH BGS  DEPTH BGS  FILTER PACK  PROPER  FILTER PACK  PREPACKED FILTER  VOLUME CALCULATED:  AMOUNT USED:  DEPTH BGS  DEPTH BGS  FILTER PACK  PROPURT  DEPTH BGS  FILTER PACK  PROPURT  METHOD INSTALLED:  DEPTH BGS  DEPTH BG	OD:	· 16 18 18 18 18 18 18 18 18 18 18 18 18 18	AMOUNT OF WATER USED: ~ 3 5 2 llove
WELL SCREEN    SCHEDULE 40 PVC     OTHER:   PRODUCT:   The hoc Schedule     MFG. BY:   MC     SAND, SIZE:   H2 (12 Mountains)     METHOD INSTALLED:   METHOD INSTALLED:     OTHER:   WATER LEVEL:     SUMP     FORMATION COLLAPSE:     OTHER:   PRODUCT:   MFG. BY:     OTHER:   WATER LEVEL:     OTHER:   PRODUCT:   MFG. BY:     METHOD INSTALLED:   DEPTH BGS     DEPTH BGS     DEPTH BGS     DEPTH BGS     DEPTH BGS     DEPTH BGS     N/A = NOT APPLICABLE     NR = NOT APPLICABLE	CLENGTH OF CASING:	- > -	
DISCHEDULE 40 PVC  OTHER:  PRODUCT:  MFG. BY:  LENGTH OF SCREEN:  LENGTH OF SCREEN:  DEPTH BGS  DEP	The state of the s		PROSESSED EILTED PACK
OTHER: PRODUCT:  MFG. BY:  SAND, SIZE:  LENGTH OF SCREEN:  DEPTH BGS  DEPTH BGS  OCHINA  WATER LEVEL:  DEPTH BGS  DEPTH BGS  OVOLUME CALCULATED: AMOUNT USED:  DEPTH BGS  OCHINA  MFG. BY:  METHOD INSTALLED:  DEPTH BGS  DEPTH BGS  DEPTH BGS  DEPTH BGS  NIA:  N		***:::  <b>=</b>  ::::	
PRODUCT: The bold of the bold	SCHEDULE 40 PVC		
MFG. BY:  CASING DIAMETER  OD: SLOT SIZE: LENGTH OF SCREEN:  DEPTH BGS  DEPTH	OTHER:		AMOUNT USED: 601 br
CASING DIAMETER  OD:  SLOT SIZE:  LENGTH OF SCREEN:  DEPTH BGS  BOREHOLE BACKFILL  AMOUNT CALCULATED:  AMOUNT CALCULATED:  BENTONITE CHIPS, SIZE:  DEPTH BGS  DEPTH B	PRODUCT: Los Loc Screen		HEAD SIZE #2/12 Manteres
MFG. BY:	MFG. BY: Boot hong year		PRODUCT RMC Pactific
SLOT SIZE:  LENGTH OF SCREEN:  DEPTH BGS  BOREHOLE BACKFILL  AMOUNT CALCULATED:  AMOUNT USED:  BENTONITE CHIPS, SIZE:  BENTONITE PELLETS, SIZE:  SLURRY:  FORMATION COLLAPSE:  OTHER:  PRODUCT:  MFG. BY:  METHOD INSTALLED:  DEPTH BGS  METHOD INSTALLED:  DEPTH BGS  METHOD INSTALLED:  WATER LEVEL:  (BTOC AFTER WELL INSTALLATION)  CENTRALIZERS USED?  CENTRALIZER DEPTHS:  LEGEND  BGS = BELOW GROUND SURFACE  BTOC = BELOW TOP OF CASING  N/A = NOT APPLICABLE  NR = NOT APPLICABLE  NR = NOT RECORDED	Marie III		MEG BY: Lapa Lustra
BOREHOLE BACKFILL  AMOUNT CALCULATED: AMOUNT USED: BENTONITE CHIPS, SIZE: BENTONITE PELLETS, SIZE: SLURRY: FORMATION COLLAPSE: PRODUCT: MFG. BY: METHOD INSTALLED: DEPTH BGS DEP	10 13		METHOD INSTALLED:
BOREHOLE BACKFILL  AMOUNT CALCULATED: AMOUNT USED:  BENTONITE CHIPS, SIZE:  BENTONITE PELLETS, SIZE:  SLURRY:  FORMATION COLLAPSE:  OTHER: PRODUCT: MFG. BY:  METHOD INSTALLED: DEPTH BGS			1000
BOREHOLE BACKFILL  AMOUNT CALCULATED: AMOUNT USED:  BENTONITE CHIPS, SIZE: BENTONITE PELLETS, SIZE: FORMATION COLLAPSE: OTHER: PRODUCT: MFG. BY: METHOD INSTALLED: DEPTH BGS  DEPTH BGS  WATER LEVEL: (BTOC AFTER WELL INSTALLATION)  CENTRALIZERS USED?  CENTRALIZERS USED?  CENTRALIZER DEPTHS:  LEGEND  BGS = BELOW GROUND SURFACE BTOC = BELOW TOP OF CASING N/A = NOT APPLICABLE NR = NOT APPLICABLE NR = NOT RECORDED	LENGTH OF SCREEN.		7.001.111
BOREHOLE BACKFILL  AMOUNT CALCULATED:  AMOUNT USED:  BENTONITE CHIPS, SIZE:  BENTONITE PELLETS, SIZE:  FORMATION COLLAPSE:  OTHER:  PRODUCT:  MFG. BY:  METHOD INSTALLED:  POURED  TREMIE  DEPTH BGS  CENTRALIZERS USED?  CENTRALIZER DEPTHS:  CENTRALIZER DEPTHS:  LEGEND  BGS = BELOW GROUND SURFACE  BTOC = BELOW TOP OF CASING  N/A = NOT APPLICABLE  NR = NOT RECORDED			WATER LEVEL:
AMOUNT USED:    BENTONITE CHIPS, SIZE:		"\"   \	(BTOC AFTER WELL INSTALLATION)
BENTONITE CHIPS, SIZE:  BENTONITE PELLETS, SIZE:  SLURRY:  FORMATION COLLAPSE:  OTHER:  PRODUCT:  METHOD INSTALLED:  POURED  TREMIE  DEPTH BGS  CENTRALIZERS USED?  LEGEND  BGS = BELOW GROUND SURFACE  BTOC = BELOW TOP OF CASING  N/A = NOT APPLICABLE  NR = NOT RECORDED	AMOUNT CALCULATED:		
DEPTH BGS	AMOUNT USED:		THE PARTY OF THE P
SLURRY:    FORMATION COLLAPSE:   OTHER:			CENTRALIZERS USED?
FORMATION COLLAPSE:	_		)
OTHER:  PRODUCT:  MFG. BY:  METHOD INSTALLED:  DEPTH BGS  DEPTH BGS  DEPTH BGS  BGS = BELOW GROUND SURFACE BTOC = BELOW TOP OF CASING N/A = NOT APPLICABLE NR = NOT RECORDED			CENTRALIZER DEPTHS:
PRODUCT:  MFG. BY:  METHOD INSTALLED:  DEPTH BGS  DEPTH BGS  BGS = BELOW GROUND SURFACE  BTOC = BELOW TOP OF CASING  N/A = NOT APPLICABLE  NR = NOT RECORDED			222
MFG. BY:  METHOD INSTALLED:  DEPTH BGS  BGS = BELOW GROUND SURFACE  BTOC = BELOW TOP OF CASING  N/A = NOT APPLICABLE  NR = NOT RECORDED	OTHER:		LEGEND
METHOD INSTALLED:  DEPTH BGS  BTOC = BELOW TOP OF CASING  N/A = NOT APPLICABLE  NR = NOT RECORDED			RGS = BELOW GROUND SURFACE
POURED ☐ TREMIE  N/A = NOT APPLICABLE  NR = NOT RECORDED		DEPTH BGS	BTOC = BELOW TOP OF CASING
NR = NOT RECORDED	METHOD INSTALLED:		
OTHER: TOC = TOP OF CASING			17/1/20/00/00/00/00
	OTHER:		TOC = TOP OF CASING



### MONITORING WELL COMPLETION RECORD

MONITORING WELL	SURFACE COMPLETION 3033000	SURVEY INFORMATION
MONITORING WELL	☐ FLUSH MOUNT	TOC ELEVATION:
MONITORING WELL NO COW 92	ABOVE GROUND WITH BUMPER POST	GROUND SURFACE ELEVATION:
PROJECT: Tay for Bit Scampling	□ CONCRETE □ ASPHALT	NORTHING:
SITE: 30 CONCOVEL NUTS		EASTING:
BOREHOLE NO.:	well bax to be added on	DATE SURVEYED:
WELL PERMIT NO.:	10 (24/43) 01	SURVEY CO.:
TOC TO BOTTOM OF WELL: 14'8"		ATW
	40.	ANNULAR SEAL
DRILLING INFORMATION	TOP OF CASING: S	VOLUME CALCULATED:
DRILLING BEGAN:	SURFACE)	AMOUNT USED:
DATE: LLIZZ 63 TIME:	10000	GROUT FORMULA (PERCENTAGES)
WELL INSTALLATION BEGAN:	1000000000	PORTLAND CEMENT:
DATE: LUZZ/Ø3 TIME:		BENTONITE:
WELL INSTALLATION FINISHED:	00000	WATER:
DATE: 11/22/03 TIME:	0000	□ PREPAREDMIX
DRILLING CO. Procession sumple	DEPTH BGS	PRODUCT:
DRILLER: David Cowell	DEPTH BOS	MFG. BY:
LICENSE:		METHOD INSTALLED:
DRILL RIG: Hand auger	Service County	DOURED TREME
DRILLING METHOD:		DOTHER:
☐ HOLLOW STEM AUGER		d other.
☐ AIR ROTARY		
O OTHER: Hand auger		BENTONITE SEAL
DIAMETER OF AUGERS:		WO COSCUTT
DIAMETER OF AUGERS:		AMOUNT USED: ~ 0 . 67 CU, Ft.
	700 700 Paring	
		CHIPS, SIZE: medium 3/8/1
WELL CASING	11	OTHER:
SCHEDULE 40 PVC	3 DEPTH BGS	PRODUCT: Idale Plus
	DEPTH BGS	MFG. BY: Bay and
PRODUCT: Thi-Loc Casing	- 1/-	// METHOD INSTALLED:
MFG. BY: Boat Long your	100	POURED TREMIE
CASING DIAMETER:	DEPTH BGS	OTHER:
12/14 00: 1	- 174	AMOUNT OF WATER USED: Nove - Water
LENGTH OF CASING:	- 1. 6 _ 300 _ 300	hose up during installation.
	DEPTH BGS	
WELL SCREEN WELL		FILTER PACK
SCHEDULE 40 PVC		PREPACKED FILTER
		VOLUME CALCULATED:
PRODUCT: Thinks School		AMOUNT USED: 140162
MFG. BY: Bout Long year		SAND, SIZE: # 2/12
CASING DIAMETER:		PRODUCT: Lapa hystoc
CASING DIAMETER:	— RXXI=RXXI	MFG. BY: RME PORTE Materials
SLOT SIZE: 0.10	— (※)(三(※))	METHOD INSTALLED:
LENGTH OF SCREEN: 18	— [20] <b>= [3</b> ] (3) (4)	POURED TREMIE
		OTHER:
BOREHOLE BACKFILL	116"	WATER LEVEL:(BTOC AFTER WELL INSTALLATION)
AMOUNT CALCULATED:		(BTOC AFTER WELL INSTALLATION
AMOUNT USED:	DEPTH BGS SUMP	-41
BENTONITE CHIPS, SIZE		CENTRALIZERS USED?
BENTONITE PENETS, SIZE:		16 16
		YES NO;
SLURRY:	DEPTH BO	CENTRALIZER DEPTHS:
FORMATION COLLAPSE:		
OTHER:	1/2	LEGEND
PRODUCT:	Dillo	BGS = BELOW GROUND SURFACE
MFG. BY	DEPTHEGS	BTOC = BELOW TOP OF CASING
METHOD INSTALLED:		N/A = NOT APPLICABLE
Frooning		NR = NOT RECORDED
OTHER:		TOC = TOP OF CASING



# MONITORING WELL COMPLETION RECORD

and the second second	<b>製鋼 SURFACE COMPLETION </b>	SURVEY INFORMATION
MONITORING WELL	☐ FLUSH MOUNT	TOC ELEVATION:
WALLES WELL NO ( WO)	T FLUSH MOUNT	GROUND SURFACE ELEVATION:
PROJECT: Lawley 15 13 Concord Nov >	ABOVE GROUND WITH BUMPER POST	NORTHING:
	CONCRETE ASPHALT	EASTING:
BOREHOLE NO.: Wo	ill box to be added on	DATE SURVEYED:
	124103.	SURVEY CO.:
TOC TO BOTTOM OF WELL: 15/0//	- TI	-
	· '   ·   '	
TO DIA TION SCORES	TOR OF CASING 42	ANNULAR SEAL
DRILLING INFORMATION	TOP OF CASING (FEET ABOVE GROUND SURFACE)	VOLUME CALCULATED:
DRILLING BEGAN:	SURFACE)	AMOUNT USED
DATE: 10/22/03 TIME: 0940	0000000	GROUT FORMULA (PERCENTAGES)
WELL INSTALLATION BEGAN: -		PORTLAND CEMENT:
DATE: 10122103 TIME:		BENTONITE:
WELL INSTALLATION FINISHED:	10100 00010	WATER:
DATE: 10 22 143 TIME:	0000	□ PREPARED MIX
DRILLING CO .: Procuses Sampling	DEPTH BGS	PRODUCT:
DRILLER: Daniel Course		MFG, BY:
LICENCE		METHOD INSTALLED:
DRILL RIG: Itand augen	Section Constitution	POWRED TREMIE
DRILLING METHOD:		Office:
☐ HOLLOW STEM AUGER		dymen.
☐ AIR ROTARY		-
DOTHER: Hand auger		BENTONITE SEAL
DIAMETER OF AUGERS:		VOLUME CALCULATED: OOCUSCUST.
DIAMETER OF AUGERS:		AMOUNT USED: VO.O5 cuft.
	10 Aug	
		D PELLETS, SIZE:
WELL CASING		CHIPS, SIZE: medium
	Name Contract	OTHER:
MISCHEDULE 40 PVC Pro-pact	DEPTH BGS	PRODUCT: Hale Plus
OTHER:		MFG. BY: Baroid
PRODUCT: Thi-Lac Casing	1211	METHOD INSTALLED:
MFG. BY: Boat Longycon	DEPTH BGS	POURED   TREMIE
CASING DIAMETER: (1	1000 1000	COTHER:
CASING DIAMETER: (1 OD: LENGTH OF CASING: 15'0''	1000 1000	MOUNT OF WATER USED. NOWO. WOLEN
LENGTH OF CASING: 15'0"		AMOUNT OF WHITE INSTANCE.
10	DEPTH BGS	
WELL SCREEN		FILTER PACK
DESCHEDULE 40 PVC Pro & ack		PREPACKED FILTER
,		VOLUME CALCULATED:
PRODUCT: The-Lac Schear		AMOUNT USED: VHO 165.
MFG. BY: BOOK LONGYEOUT		SAND, SIZE: #2/12 Mover CYCY
THE PROPERTY OF THE PARTY OF TH		PRODUCT: RMC Pacofic
ID: 13.00: 13.54		MFG. BY: Luga Lustre
00 .10"	10001 <b>=</b> 10001	METHOD INSTALLED:
LENGTH OF SCREEN: 10'6"	\cdot\cdot\cdot\cdot\cdot\cdot\cdot\cdot	POURED TREMIE
LENGTH OF SOREER		OTHER:
0.0000000	· · · · · · · · · · · · · · · ·	WATER LEVEL:
BOREHOLE BACKFILL	11/6/1	(BTOC AFTER WELL INSTALLATION)
AMOUNT CALCULATED: ~ 10 165.		
AMOUNT USED: W 10 16	DEPTH BGS SUMP	
BENTONITE CHIPS, SIZE:		CENTRALIZERS USED?
☐ BENTONITE PELLETS, SIZE:		U PES DONO:
□ SLURRY:	DEPTH BGS	CENTRALIZER DEPTHS:
☐ FORMATION COLLAPSE:	DEP IN BGS	CENTRALIZER DEPTHS.
MOTHER: Sand 42/12 Mondary		
		LEGEND
PRODUCT:	12.6	BGS = BELOW GROUND SURFACE
MFG. BY:	DEPTH BGS	BTOC = BELOW TOP OF CASING
METHOD INSTALLED:  MA POURED □ TREMIE		N/A = NOT APPLICABLE
A POORLED		NR = NOT RECORDED
OTHER:		TOC = TOP OF CASING

**APPENDIX D** MONITORING WELL SAMPLING SHEETS

### TETRA TECH EM INC. LOW-FLOW MONITORING WELL SAMPLING SHEET

Monitoring Well N	No.: G4	1001	Date: _	11-26-03
Project: TAycore	BLUD F	BRIDGE-CONGRD	NW5 Project No.: 69016	.0450302020709
Personnel: 72.	A .			
Depth to Water:	7.37	_ft btoc	Begin Pumping:/	066

Depth to Well Bottom: 13.90 ft btoc End Sampling: 1/20
Water Column: 6.53 ft

Time	Total Volume Purged	Flow Rate (ml/min)	Water Level	Temp (C)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	рН	ORP	Turbidity (NTU)
1006	0								
1010	- 1		8.32	17.44	4614	2.74	8.05	118.5	290.2
1014	2		8.31	17.93	4701	1.51	8.13	105.1	116.3
1017	3		8.36	18.17	4696	1.24	8.13	98.5	913
1021	4		8.37	18.24	4682	1.17	8.13	93.1	55.4
1025	5		8.37	18,30	4674	1.07	8.12	89.2	37.7
1028	6		8.37	18.37	4666	1.02	8.12	86.5	24.0
1032	7		8.38	18.39	4650	0.97	8.11	83.5	13.1
1035	8		8.38	18.40	4639	0.98	8.11	80.4	10.9
1039	9		8.38	18.46	4625	0.91	8.10	76.2	6.3
1043	10		8.37	18.43	4628	0.92	8.11	76.1	4.9
1051	12		8.37	18.44	4614	0.89	8.10	75.0	4.3
1059	14		8.37	18.41	4598	0.85	8.10	74.0	1.5
1107	16		8.37	18.43	4599	0.84	8.10	74.0	2.4
1115	18		8.37	18.44	4598	0.84	8.10	73.5	1.4

Chain of Custody No.: 4430 4490	Time of Water Sample:
Water Sample ID: <u>045346w001</u>	
QC Sample ID:	Type of QC Sample:

### TETRA TECH EM INC. LOW-FLOW MONITORING WELL SAMPLING SHEET

Project: TAYLOR BLUD BRIDGE-CONCORD NWS Project No.: 69016.0450302020709

Personnel: R. GLENN, P. CALLAHAN

Depth to Water: 4.20 ft btoc Begin Pumping: 1/26

Depth to Well Bottom: 12.25 ft btoc End Sampling: 1340

Water Column: 8.05 ft

,	Total Volume	Flow Rate	Water	Temp	Conductivity	Dissolved Oxygen			Turbidity
Time	Purged	(ml/min)	Level	(C)	(uS/cm)	(mg/L)	pН	ORP	(NTU)
1/32	1		6.04	17.45	6895	3.94	7.98	93.5	172.0
1138	2		6.43	17.63	6507	1.68	7.98	57.9	420.0
1141	3		6.62	17,68	le273	1.29	7.96	40.9	405.7
1145	4		6.79	17.73	6170	1.18	7.95	33.1	312.1
1149	5		6.87	17.75	6067	1.07	7.94	28.1	198.8
1/53	6		6.72	17.75	5972	0-97	7.93	27.7	108.1
1201	8		6.72	17.73	5856	0.88	7.92	27.1	34.7
1210	10		6.72	17.77	5812	0.84	7.92	28.9	16.7
1219	12		6.73	17.77	5770	0.79	7.91	32.5	6.1
1227	14		6.72	17.79	5780	0.79	7.91	34.2	5.5
1235	16		6.72	17.81	5768	0.77	7.91	38.0	6-1
1244	18		6.72	17.82	5779	0.69	7.91	44.0	15.3
1254	20		6.72	17.87	5807	0.76	7.92	46.3	10.4
1301	22		6.72	17.85	5821	0.82	7.92	46.0	6.7
1310	24		6.72	17.85	5867	0.84	7.91	46.60	8.5
13/8	26		6.72	17.85	5803	0.82	7.92	49.1	6.9
1326	28		6.72	17-86	5763	0.81	7.92	53.7	7-3
1334	30		6.72	17.86	5781	0.82	7.92	57.5	7.60

Chain of Custody No.: 4490	Time of Water Sample:
Water Sample ID: <u>\$\phi453\phi6\psi\phi\phi2</u>	
QC Sample ID: 064530GW 442 D	Type of QC Sample: Dopucate

### TETRA TECH EM INC. LOW-FLOW MONITORING WELL SAMPLING SHEET

Monitoring Well No.: GW003 Date: \_//-25-03

Project: 14yun BUD BRIDGE - CONGRED NWS Project No.: 6946, 0450302020709

Personnel: R. GLENN Depth to Water: 4.24 ft btoc

Begin Pumping: /527

Depth to Well Bottom: /3.73 ft btoc Water Column: 9.49 ft

End Sampling: 1700

Time	Total Volume Purged	Flow Rate (ml/min)	Water Level	Temp (C)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	pН	ORP	Turbidity (NTU)
1531	l		5-33	17.26	17300	1.62	7.49		117.9
1535	2		5.22	17.22	16560	1.49	7.58		101.5
1540	3		5.21	17.17	14946	1.37	7.62	-52.7	78.6
1544	4		526	17.15	14096	1.21	7.64	-57.0	61-1
1547	5		5.51	17.30	13604	1.//	7.64	-62.8	51.5
1551	4		551	17.34	13286	1.06	7.65	-ldo.7	77.0
1555	7		5.51	17.34	12982	1.03	7.65	-69.3	70.3
1559	8		5.52	17.28	12649	1.08	7.66	-71-1	43.1
1603	9		5.52	17.30	12360	1.05	7.66	-74.3	26.4
1607	10		5.52	17.17	12067	1.02	7.66	-75.4	14.0
1612	1/		5.52	17.18	11846	0.95	7.66	-76.2	10.1
1620	13		5.52	17.16	11542	0.89	7-67	- 79.5	7.5
1628	15		5.52	17.12	11207	0.86	7.69	-79.9	3.8
1638	17		5.52	17.02	10896	0.84	7.69	-81.0	4.4
1640	19		5.52	16.98	10836	0.92	7.69	-81.7	2.5
1648	21		5.52	16.93	10706	0.91	7.69	-81.8	3.4
1656	23		5.52	16.91	10676	0.90	7.69	-81.6	2.60

Chain of Custody No.: 4491, 4528	Time of Water Sample: 1760	
Water Sample ID: <u>Ø453</u> \$\psi 6\omega \phi 3		
QC Sample ID:	Type of QC Sample:	-

APPENDIX E
CHAIN-OF-CUSTODY RECORDS

Chain of Custody Record No. 4514

135 Main St. Suite 1800					Preservative Added
San Francisco. CA 94105	Lab PO#:	Lab: CFT		4514	Nove
415-543-4880 Fax 415-543-5480	032219 Mod ant	Frekary	CA	No./Container Types	Analysis Required
Project name: CONCORD NWS TBB FIRE INNETIGATES	THEMI technical contact:  RAMEN MOEIZZ 1	Field samplers:  R. GLOMA  P. CALLAN	,		
Project (CTO) number:	TtEMI project manager:	Field samplers' signatures	:   8		apples v
6906.0450302024719	CINDI FORE	ton Ol	. WSD	<u>   </u>	VOA  VOA  VOA  Vest/PCBs  Vetals  Veta
Sample ID	Sample Location (Pt. ID)	Date Time	Matrix <sup>S</sup>	40 ml VOA 1 liter Amb 500 ml Poly Sleeve Glass Jar	VOA SVOA SVOA Metals < TPH Purg TPH Extri
04530 SBQQ1	SB201 4-54 bgs	11-24-63 1535	5 501L	5	XXXXXXX
0453053002	SB202 3-4	1 15/0		5	XXXXXXXXX
	3B203, 3.75-4.75	1430		5	XXXXXXXX
	SB204 2-3	1610		4	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
14530 SB005	SB205 1-2	1 1200	5 Y	4	XXXXXXXXX
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To the state of th					
				<u>                                      </u>	

0.1	Name (print)	Company Name	Date	Time
Relinquished by:	Patrick Callatian	18/10 lech	11/25/03	8:25
Received by:				
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks:

TOC alded by R.M., 11/26/03.

Fed Ex #:



Fed Ex #:

Chain of Custody Record No. 4491

Page \_\_\_\_ of \_\_\_

ontact: Molizzi  nager: Cose Location (Pt. ID)  3.75-4.75	Field sample	Silena Callatia signatures: Time	•	SD	40 ml VOA	Con	491 cainer I		SVOA Pest/PCBs	A	N o	N	-	quire		
ontact:  MOCIZZI  mager:  Cose  cocation (Pt. ID)	Field sampler    Field sampler	Silena Callatia signatures: Time	Matrix Soil Water Soil	SD	40 ml VOA	Con	ainer T	ypes	SVOA Pest/PCBs	A	Anal	lysis	s Rei	quire	1	
ontact:  MOCIZZI  mager:  Cose  cocation (Pt. ID)	Field sampler    Field sampler	Silena Callatia signatures: Time	Matrix Soil Water Soil	SD	40 ml VOA				SVOA Pest/PCBs				s Rei	quire		
Molizzi  mager:  cocation (Pt. ID)  3.75-4.75	Field sampler  Field sampler  Date	FIEND Callolo s'signatures: Time	Matrix Soil Water Soil	MS/MSD	 	500 ml Poly	Sleeve Glass Jar	VOV.	SVOA Pest/PCBs	Metals	I'TH Furgeables TPH Extractables	X X				
nager: Sose Location (Pt. ID) S 3.75-4.75	Field sampler  Date	Callova s' signatures: Time	Matrix Soil Water Soil	MS / MSD	 	500 ml Poly	Sleeve Glass Jar	VOA	SVOA Pest/PCBs	Metals	TPH Extractables	Z X X			-	
Cose ocation (Pt. ID)	Date	Time 1430 1430	Soil Water Soil	MS / MSD	 	500 ml Poly	Sleeve Glass Jar	VOA	SVOA	Metals True B. Lie	TPH Furgeables TPH Extractables	X			-	
ocation (Pt. ID)	Date	1430 1430 14005	Soil Water Soil	MS / MS	 	500 ml Poly	- X Glass Jar	YO.	SVOA Pest/PCBs	Metals	TPH Purges	XX			-5	
3.75-4.75	11/24/03 W/25/03 11/24/03 11/24/03	1430 1430 14005	Soil Water Soil	WS	 	200 m	- X Glass,	A <sub>C</sub> O	SVOA	Metals	TPH F	X			,	
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Chain of Custody Record No. 4528

Page 1 of
Preservative Added

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Fax 415-543-5480	032211	Der	KELET	CA		No.	./C	ont	aine	r Types	S			Ana	lysis	s Rec	quir	ed	
Project name: Concord NUS	TtEMI technical contact:	Field sampler	rs:												11				
TBB Frew MUESTICATIO	J NAMIA BORISOVA	Field sampler	LLAHAN	/															
Project (CTO) number:	TtEMI project manager:	Field samplers	s' signatures:		Ü	,	-							bles	3				
69016.0450302020709	CINDI POSE	( Kon!	De_		S / MSD	1V0A	1 liter Amber	500 ml Poly	Jar			PCBs	ls	TPH Purgeables	163	ا لي			
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Turnaround time/remarks:																	****		
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Fed Ex #:

Chain of Custody Record No. 4490

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Fax 415-543-5480						10./	T	ша	HICI	Type	3	<del></del>	1	-A	Hai	you		-qui	Teu			-
Project name: ( on (ord NW) 5	TtEMI technical contact:	Field sampler	P Callar	IOA																		
TBB Field Investigation	Ramæn Moeizzi	Field sampler	Z. Clcv	in.																		
Project (CTO) number:	TtEMI project manager:	Field samplers	signatures:		ا چ									ples	tables		7					
390160450302020709	Cird. Rose	NATO			S / MSD	40 ml VOA 1 liter Ambe	500 ml Poly		Jar				CBs	Metals TPH Purgeables	TPH Extractable	<u> </u>	£ .					
Sample ID	Sample Location (Pt. ID)	Date	Time	Matrix	Ž	40 m 1 lite	500 n	Sleev	Glass Jar		VOA	SVO.	Pest/PCBs	Meta	TPH	1	ناد	<b>)</b> 1+				
04530EWODL	6W606	11/26/2	1130	Water	6	7 5					X	X	X	XX	攵	X	XX	X				
245306W00ZD			-		-		-13	<u> </u>		-	1				$\pm$	X	XX		$\pm \pm$		1	P
345326WX6Z	6W00Z	1	1210			98	3	4			X	X	ĮΧĮ	$\times \times$	<u> </u>	X	$\langle   \rangle$	$\bowtie$	11			
045306WODZD	GWOOZ DUP		_ ′ ′			98	3			1	X	X	X.	$X \mid X$	X	X	$\swarrow$	X	$\perp \perp$			
14530188Z	GW882 Dop trap blank		600		-  -	3,	+				$\bot$	4	-	+	+	1		1	+	1 1	4	-
			The state of the s		4		+	-			+	$\dashv$	'	+	+	$\vdash$	+	$\vdash$	+	++	+	1
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APPENDIX F
SEDIMENT BORING LOGS

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DO:
Bldg./Site: CONCORD WWS- 5176 30
Project Name: Lyun Buo Bride

Boring Number: SB201 Date Started: Drilling Method: (Circle one) HSA Continuous Core/Direct Push/Hand Date Completed: Auger Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum Logged By: Outer Diameter of Boring: 3-INCH Drilling Subcontractor: Inner Diameter of Well Casing: Driller: Depth to Water (ft./bgs.) Location Sketch: 0201 WATER / WATER 0

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dla.	Description	USCS soil symbol	Well construction	OVM (ppm)
		-				FILL / DEBRIS  FILL CONSIST OF ORGANIC SILES, FOOTS, AND  SOME BROKEN GLASS.  DANK BROWN 10 4 12 3/3, CON PLASTIC TOY,  SATURATION, SOFT.	Fin / B Degers		-
	 - 3 	-	-	-		No Recovery	· -		
<b>(30</b>				OK345BBB1		PERT: DARK PEDDISH BROWN 54R3/3, CON PLASTICITY. SATURATES, SOFT. TD=5.0 41 bgs	(T		

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DO:

Bldg./Site: CONCORD NWS- SITE 30 Project Name: Toycor Bus Bridge

	0,,,
Boring Number: SBZ4Z	Date Started: //-24-03
Drilling Method: (Circle one) HSA Continuous Core/Direct Push Hand Auger	Date Completed: 11-24-03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: R. GLEN
Outer Diameter of Boring: 3 - INCH	Drilling Subcontractor: Percision
Inner Diameter of Well Casing: VA	Driller: E. TAPALLA
Depth to Water (ft./bgs.) 13"	Location Sketch:
marst 202	

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
1505				443438002		FILL / DEBRIS:  FILL CONSIST OF BROKEN GLASS, ROOTS, AND ORGANIC SILTS.  DARK BROWN 10 YR 3/3, LOW PLASTICITY, SATURATION, SOFT.  PEAT:  DAME REDDISH BROWN 5 YR 3/3, LOW PLASTICITY, SATURATION, SOFT.	Pr Ful Desers		

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DO: Bldg./Site: Concord NWS-5176-30
Project Name: TAyLon BLUD BRACK

Boring Number: SB203	Date Started: 11-24-03
Drilling Method: (Circle one) HSA Continuous Core/Direct Push/Hand Auger	Date Completed: 11-24-03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: R. GLENN
Outer Diameter of Boring: 3- INCH	Drilling Subcontractor: PERCISION
Inner Diameter of Well Casing: 1/4	Driller: E. TAPALLA
Depth to Water (ft./bgs.) ~ 4"	Location Sketch:
MARSH	• 203

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dla.	Description	USCS soil symbol	Well construction	OVM (ppm)
			_			FILL / DEBRIS  MATERIAL CONSIST OF BROKEN GLASS, ROOTS, AND ORGANIC SILTS.  DANK PROWN 10 YR 3/3, CON PLASTICITY, WET TO SATURATION, SOFT	FILL (DEDRUS		
1425	-3 -4 -	-		4453458		No RECOVERY  PEAT: DARK REDDISH BROWN 5 YR 3/S, CON PLASTICY SATURATION, SOFT.	r.		

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# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg./Site:Conscience NWS- Stree 30
Project Name: Taylor Bun Bunoch

Boring Number: SB204	Date Started: 1/-24-03
Drilling Method: (Circle one) HSA Continuous Core/Direct Push/Hand Auger	Date Completed: 1/-24-03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: R. GUENN
Outer Diameter of Boring: 3 - /NCH	Drilling Subcontractor: PERCISION
Inner Diameter of Well Casing: NA	Driller: E. TAPALLA
Depth to Water (ft./bgs.)	Location Sketch:
0	0 0

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dla.	Description	USCS soil symbol	Well construction	OVM (ppm)
				7 ask		FILL / DEBRIS: FILL CONSIST OF BROKEN GLASS AND ORGANIC SILTS.  DARK BROWN LO YR 3/3, LOW PLASTICITY MOIST, MEDIUM STIFE.  CLAY: LIGHT BROWN 75 YR 6/4, HIGH PLASTICITY, MOIST, MEDIUM STIFE.	CH   FILL (DEBLES		
1610	3			\$45545BB\$		TD=3.0 A bgs			-

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# SOIL BORING AND WELL INSTALLATION AND VISUAL CLASSIFICATION LOG

DO:
Bldg:/Site: Conkored NWS-578-30
Project Name: TAylor Bur BRIDGE

Boring Number: SB205	Date Started: 1/-24-03
Drilling Method: (Circle one) HSA Continuous Core/Direct Push/Hand Auger	Date Completed: 11-24-03
Air Rotary/Mud Rotary/Dual Tube Percussion/Sonic/Vacuum	Logged By: R. Guew
Outer Diameter of Boring: 3"	Drilling Subcontractor: Percision
Inner Diameter of Well Casing:	Driller: E-TAPALLA
Depth to Water (ft./bgs.) NA	Location Sketch:
MARSH	0 205

Time	Depth (ft) bgs	Drive Interval	Recovered Interval	Sample ID	Blow count V.B. utility (per 6 inches) type, dia.	Description	USCS soil symbol	Well construction	OVM (ppm)
			-			FILL / DEBRIS:  FILL CONSIST OF ORGANIC SILTS, BROKEN GLASS, AND POOTS.  DARK BROWN 10 YR 3/3, LOW PLASTICITY, WET, SOFT.	Flu / DeBals		-
				5345Bads-		ORGANIC SICTS: VORY DARK GRAY 5 4K 3/1, LOW PLASTICITY, SATURATED TO WET, SOFT	8		
1200			-	100		TD=2.0 4 bgs.			

APPENDIX G
VALIDATED LABORATORY ANALYTICAL RESULTS AND DATA VALIDATION
REPORTS

APPENDIX G-1
VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 - 3.00
Semivolatiles 8270 (in μg/Kg)			1		L
1,2,4-TRICHLOROBENZENE 1,2-DICHLOROBENZENE 1,3-DICHLOROBENZENE 1,4-DICHLOROBENZENE	1,100 U 1,100 U 1,100 U 1,100 U	1,400 U 1,400 U 1,400 U 1,400 U	1,800 U 1,800 U 1,800 U 1,800 U	450 U 450 U 450 U 450 U 450 U	400 U 400 U 400 U 400 U 400 U
2,4,5-TRICHLOROPHENOL 2,4,6-TRICHLOROPHENOL 2,4-DICHLOROPHENOL 2,4-DIMETHYLPHENOL	1,100 U 1,100 U 1,100 U 1,100 U	1,400 U 1,400 U 1,400 U 1,400 U	1,800 U 1,800 U 1,800 U 1,800 U	450 U 450 U 450 U 450 U	400 U 400 U 400 U 400 U
2,4-DINITROPHENOL 2,4-DINITROTOLUENE 2,6-DINITROTOLUENE 2-CHLORONAPHTHALENE	5,300 U 1,100 U 1,100 U 1,100 U	6,900 U 1,400 U 1,400 U 1,400 U	9,200 U 1,800 U 1,800 U 1,800 U	2,200 U 450 U 450 U 450 U	2,000 U 400 U 400 U 400 U
2 · CHLOROPHENOL 2 · METHYLNAPHTHALENE 2 · METHYLPHENOL 2 · NITROANILINE	1,100 U 210 U 1,100 U 2,100 U	1,400 U 280 U 1,400 U 2,800 U	1,800 U 370 U 1,800 U 3,700 U	450 U 89 U 450 U 890 U	400 U 80 U 400 U 800 U
2-NITROPHENOL 3,3'-DICHLOROBENZIDINE 3-NITROANILINE 4,6-DINITRO-2-METHYLPHENOL	2,100 U 2,100 U 2,100 U 5,300 U	2,800 U 2,800 U 2,800 U 6,900 U	3,700 U 3,700 U 3,700 U 9,200 U	890 U 890 U 890 U 2,200 U	800 U 800 U 800 U 2,000 U
4-BROMOPHENYL-PHENYLETHER 4-CHLORO-3-METHYLPHENOL	1,100 U 1,100 U	1,400 U 1,400 U	1,800 U 1,800 U	450 U 450 U	400 U 400 U

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed,  $R = Rejected result <math>\mu g/kg = Micrograms$  per kilogram, mg/kg = Milligrams per kilogram

Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-1
VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 - 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 - 3.00
Semivolatiles 8270 (in μg/Kg)			1		1
4 - CHLOROANILINE 4 - CHLOROPHENYL - PHENYLETHER 4 - METHYLPHENOL 4 - NITROANILINE	1,100 U 1,100 U 1,100 U 1,100 U 2,100 U	1,400 U 1,400 U 1,400 U 2,800 U	1,800 U 1,800 U 1,800 U 3,700 U	450 U 450 U 450 U 450 U 890 U	400 U 400 U 400 U 800 U
4 - NITROPHENOL ACENAPHTHENE ACENAPHTHYLENE ANTHRACENE	2,100 U 210 U 210 U 210 U	2,800 U 280 U 280 U 280 U	3,700 U 370 U 370 U 370 U	890 UJ 89 U 89 U	800 U 80 U 80 U 80 U
BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE BENZO(G,H,I)PERYLENE	210 U 210 U 210 U 210 UJ	280 U 280 U 280 U 280 UJ	370 U 370 U 370 U 370 UJ	89 U 89 U 89 U 89 UJ	80 U 80 U 80 U 80 UJ
BENZO(K) FLUORANTHENE BIS(2-CHLOROETHOXY)METHANE BIS(2-CHLOROETHYL)ETHER BIS(2-CHLOROISOPROPYL)ETHER	210 U 1,100 U 1,100 U 1,100 U	280 U 1,400 U 1,400 U 1,400 U	370 U 1,800 U 1,800 U 1,800 U	89 U 450 U 450 U 450 UJ	80 U 400 U 400 U 400 U
BIS(2-ETHYLHEXYL)PHTHALATE BUTYLBENZYLPHTHALATE CARBAZOLE CHRYSENE	1,100 U 1,100 U 1,100 U 210 U	1,400 U 1,400 U 1,400 U 280 U	1,800 U 1,800 U 1,800 U 370 U	450 U 450 U 450 U 89 U	400 U 400 U 400 U 80 U
OI-N-BUTYLPHTHALATE DI-N-OCTYLPHTHALATE	1,100 U 1,100 U	1,400 U 1,400 U	1,800 U 1,800 U	450 U 450 U	400 U 400 U

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Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-1

VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 - 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 - 3.00
Semivolatiles 8270 (in μg/Kg)			1		<u> </u>
DIBENZ (A,H) ANTHRACENE	210 UJ	280 UJ	370 UJ	89 UJ	80 UJ
DIBENZOFURAN	1,100 U	1,400 U	1,800 U	450 U	400 U
DIETHYLPHTHALATE	1,100 U	1,400 U	1,800 U	450 U	400 U
DIMETHYLPHTHALATE	1,100 U	1,400 U	1,800 U	450 U	400 U
FLUORANTHENE	210 U	280 U	370 U	89 U	80 U
FLUORENE	210 U	280 U	370 U	89 U	80 U
HEXACHLOROBENZENE	1,100 U	1,400 U	1,800 U	450 U	400 U
HEXACHLOROBUTADIENE	1,100 U	1,400 U	1,800 U	450 U	400 U
HEXACHLOROCYCLOPENTADIENE HEXACHLOROETHANE INDENO(1,2,3-CD)PYRENE ISOPHORONE	5,300 UJ	6,900 UJ	9,200 UJ	2,200 UJ	2,000 UJ
	1,100 U	1,400 U	1,800 U	450 U	400 U
	210 UJ	280 UJ	370 UJ	89 UJ	80 UJ
	1,100 U	1,400 U	1,800 U	450 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	1,100 U	1,400 U	1,800 U	450 U	400 U
N-NITROSODIMETHYLAMINE	1,100 U	1,400 U	1,800 U	450 UJ	400 U
N-NITROSODIPHENYLAMINE	1,100 U	1,400 U	1,800 U	450 U	400 U
NAPHTHALENE	210 U	280 U	370 U	89 U	80 U
NITROBENZENE	1,100 U	1,400 U	1,800 U	450 U	400 U
PENTACHLOROPHENOL	2,100 U	2,800 U	3,700 U	890 U	800 U
PHENANTHRENE	210 U	280 U	370 U	89 U	80 U
PHENOL	1,100 U	1,400 U	1,800 U	450 U	400 U
PYRENE	210 U	280 U	370 U	89 U	80 U
FOTAL HIGH MOLECULAR PAHS	U	U	U	U	

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed, R = Rejected result  $\mu g/kg$  = Micrograms per kilogram, mg/kg = Milligrams per kilogram

Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-1
VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 - 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 3.00
Semivolatiles 8270 (in µg/Kg)		1	I	1	
TOTAL LOW MOLECULAR PAHS TOTAL PAHS	U U	U U	U U	ט ט	U
Pesticides (in µg/Kg)			I	L	
4,4'-DDD 4,4'-DDE 4,4'-DDT ALDRIN	11 U 11 U 11 U 6 U	14 U 14 U 14 UJ 7 U	18 U 18 U 18 UJ 9 U	4 U 4 U 4 UJ 2 U	4 U 4 U 4 UJ 2 U
ALPHA - BHC ALPHA - CHLORDANE BETA - BHC DELTA - BHC	6 U 6 U 6 U 6 U	7 U 7 U 7 U 7 U	9 U 9 U 9 U	2 U 2 U 2 U 2 U 2 U	2 U 2 U 2 U 2 U 2 U
DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE	11 U 6 U 11 U 11 U	14 U 7 U 14 U 14 U	18 U 9 U 18 U 18 U	4 U 2 U 4 UJ 4 UJ	4 U 2 U 4 U 4 U
ENDRIN ENDRIN ALDEHYDE GAMMA-BHC GAMMA-CHLORDANE	11 U 11 U 6 U 6 U	14 U 14 UJ 7 U 7 U	18 U 18 UJ 9 U 9 U	4 U 4 UJ 2 U 2 U	4 U 4 UJ 2 U 2 U
HEPTACHLOR HEPTACHLOR EPOXIDE METHOXYCHLOR	6 U 6 U 55 U	7 U 7 U 71 UJ	9 U 9 U 94 UJ	2 U 2 U 22 UJ	2 U 2 U 20 UJ

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APPENDIX G-1
VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 - 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 - 3.00
Pesticides (in µg/Kg)				L	1
TOXAPHENE TOTAL BHCS TOTAL CHLORDANES TOTAL DDTS	190 U U U U	250 U U U U	330 U U U U	79 U U U U	70 U U U U
PCBs (in µg/Kg)					1
AROCLOR-1016 AROCLOR-1221 AROCLOR-1232 AROCLOR-1242	39 UJ 77 UJ 39 UJ 39 UJ	50 UJ 100 UJ 50 UJ 50 UJ	66 UJ 130 UJ 66 UJ 66 UJ	16 U 32 U 16 U 16 U	14 U 29 U 14 U 14 U
AROCLOR - 1248 AROCLOR - 1254 AROCLOR - 1260	39 UJ 39 UJ 39 UJ	50 UJ 50 UJ 50 UJ	66 UJ 66 UJ 66 UJ	16 UJ 16 U 16 U	14 UJ 14 U 14 U
Petroleum Indicators(in mg/Kg)					
GASOLINE RANGE ORGANICS	3 U	5 U	6 U	1 U	1 U
Petroleum Indicators - Silica (	Hel (in mg/Kg)				
DIESEL C10-C24 MOTOR OIL C24-C36	12 H 47 M	18 H 63 M	23 H 110 M	1 UJ 17 M	1 UJ 6 M
CLP Metals (in mg/Kg)					
ALUMINUM ANTIMONY ARSENIC BARIUM	16,000 92.0 J 33.0 2,900	17,000 14.0 11.0 200	18,000 15.0 8.7 120	11,000 3.7 13.0 98.0	13,000 4.0 2.9 140

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed, R = Rejected result  $\mu g/kg$  = Micrograms per kilogram, mg/kg = Milligrams per kilogram

Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-1
VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 - 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 - 3.00
CLP Metals (in mg/Kg)					
BERYLLIUM CADMIUM CALCIUM CHROMIUM	0.25 J 6.1 J 6,900 J 77.0	0.39 J 1.1 UJ 6,500 J 44.0	0.46 J 0.79 J 7,100 J 46.0	0.55 0.31 UJ 3,200 J 24.0	0.53 0.33 UJ 1,700 J 23.0
COBALT COPPER IRON LEAD	9.7 740 120,000 570 J	4.0 J 92.0 38,000 240 J	3.9 J 140 26,000 180 J	8.3 30.0 23,000 100 J	9.3 13.0 13,000 8.0 J
MAGNESIUM MANGANESE MERCURY MOLYBDENUM	10,000 590 0.27 7.6	11,000 270 0.083 3.7 J	10,000 380 0.36 3.3 J	3,900 260 0.033 UJ 1.2 U	3,100 440 0.029 UJ 1.3 U
NICKEL POTASSIUM SELENIUM SILVER	65.0 J 3,900 J 1.2 0.71 J	40.0 J 4,400 J 1.1 U 1.1 U	40.0 J 4,300 J 1.0 J 1.3 U	24.0 J 2,800 J 0.31 U 0.31 U	35.0 J 1,600 J 0.33 U 0.33 U
SODIUM THALLIUM VANADIUM ZINC	25,000 3.0 J 72.0 11,000	38,000 1.1 U 55.0 370	34,000 1.3 U 63.0 290	4,300 0.46 UJ 34.0 110	3,500 0.33 U 26.0 26.0

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed, R = Rejected result  $\mu g/kg$  = Micrograms per kilogram, mg/kg = Milligrams per kilogram

Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-1
VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID			T	T	
POINT ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 - 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 - 3.00
Hexavalent Chromium (in μg/Kg)					I .
HEXAVALENT CHROMIUM	160 U	210 U	280 U	67.0 U	60.0 U
Anions, Solids, Sulfides, and	TOC (in mg/kg)				I
TOTAL ORGANIC CARBON	110,000	180,000	290,000	600	1,600
Dioxin (in μg/Kg)					
1,2,3,4,6,7,8,9-OCDD 1,2,3,4,6,7,8-HPCDD 1,2,3,4,6,7,8-HPCDF 1,2,3,4,7,8,9-HPCDF	NA NA NA NA	NA NA NA NA	0.01 0.002 J 0.005 0.003 U	NA NA NA NA	NA NA NA NA
1,2,3,4,7,8-HXCDD 1,2,3,4,7,8-HXCDF 1,2,3,6,7,8-HXCDD 1,2,3,6,7,8-HXCDF	NA NA NA NA	NA NA NA NA	0.003 U 0.002 J 0.003 U 0.001 J	NA NA NA NA	NA NA NA NA
1,2,3,7,8,9-HXCDD 1,2,3,7,8,9-HXCDF 1,2,3,7,8-PECDD 1,2,3,7,8-PECDF	NA NA NA NA	NA NA NA NA	0.003 U 0.003 U 0.003 U 0.003 U	NA NA NA NA	NA NA NA NA
2,3,4,6,7,8-HXCDF 2,3,4,7,8-PECDF 2,3,7,8-TCDD 2,3,7,8-TCDF	NA NA NA NA	NA NA NA NA	0.001 J 0.001 J 0.001 U 0.001	NA NA NA NA	NA NA NA NA
HEPTACHLORODIBENZO-P-DIOXIN	NA	NA	0.004	NA	NA

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed, R = Rejected result  $\mu g/kg$  = Micrograms per kilogram, mg/kg = Milligrams per kilogram

Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

**APPENDIX G-1** 

## VALIDATED SITE 30 SEDIMENT SAMPLE ANALYTICAL RESULTS

Point ID	SB201	SB202	SB203	SB204	SB205
Sample ID	04530SB001	04530SB002	04530SB003	04530SB004	04530SB005
Matrix	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT
Sample Date	11/24/2003	11/24/2003	11/24/2003	11/24/2003	11/24/2003
Sample Depth (in feet)	4.00 - 5.00	3.00 - 4.00	3.75 - 4.75	2.00 - 3.00	2.00 - 3.00
Dioxin (in μg/kg)				1	
HEPTACHLORODIBENZOFURAN HEXACHLORODIBENZO P-DIOXIN HEXACHLORODIBENZOFURAN OCTACHLORODIBENZOFURAN	NA NA NA NA	NA NA NA NA	0.005 0.0008 J 0.003 0.005 U	NA NA NA NA	NA NA NA NA
PENTACHLORODIBENZO-P-DIOXIN PENTACHLORODIBENZOFURAN TETRACHLORODIBENZO-P-DIOXIN TETRACHLORODIBENZOFURANS	NA NA NA NA	NA NA NA NA	0.003 U 0.02 0.001 U 0.02	NA NA NA NA	NA NA NA NA

### Notes:

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed, R = Rejected result  $\mu g/kg$  = Micrograms per kilogram, mg/kg = Milligrams per kilogram

Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2
VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Volatiles 8260 (in μg/L)		1	1	1
1,1,1-TRICHLOROETHANE 1,1,2,2-TETRACHLOROETHANE 1,1,2-TRICHLOROETHANE 1,1-DICHLOROETHANE	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	0.5 U 0.5 U 0.5 U 0.5 U
1,1-DICHLOROETHENE 1,2-DICHLOROETHANE 1,2-DICHLOROETHENE (TOTAL) 1,2-DICHLOROPROPANE	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	0.5 U 0.5 U 0.5 U 0.5 U
2 - BUTANONE 2 - HEXANONE 4 - METHYL - 2 - PENTANONE ACETONE	10 UJ 10 UJ 10 UJ 10 UJ	10 UJ 10 UJ 10 UJ 10 UJ	10 UJ 10 UJ 10 UJ 10 UJ	10 U 10 U 10 U 10 U
BENZENE BROMODICHLOROMETHANE BROMOFORM BROMOMETHANE	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	0.5 U 0.5 U 1 U 1 U
CARBON DISULFIDE CARBON TETRACHLORIDE CHLOROBENZENE CHLOROETHANE	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	0.5 U 0.5 U 0.5 U 1 U
CHLOROFORM CHLOROMETHANE CIS-1,3-DICHLOROPROPENE DIBROMOCHLOROMETHANE	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	1 UJ 1 UJ 1 UJ 1 UJ	0.5 U 1 U 0.5 U 0.5 U

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2

VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Volatiles B260 (in μg/L)			1	1
ETHYLBENZENE METHYLENE CHLORIDE STYRENE TETRACHLOROETHENE	1 UJ 10 UJ 1 UJ 1 UJ	1 UJ 10 UJ 1 UJ 1 UJ	1 UJ 10 UJ 1 UJ 1 UJ	0.5 U 10 U 0.5 U 0.5 U
TOLUENE TRANS-1,3-DICHLOROPROPENE TRICHLOROETHENE VINYL ACETATE	1 UJ 1 UJ 0.6 J 10 UJ	1 UJ 1 UJ 0.6 J 10 UJ	1 UJ 1 UJ 0.5 J 10 UJ	0.5 U 0.5 U 0.7 10 U
VINYL CHLORIDE XYLENE (TOTAL)	1 UJ 1 UJ	1 UJ 1 UJ	1 UJ 1 UJ	0.5 U 0.5 U
Semivolatiles 8270 (in $\mu { m g/L})$				I
1,2,4-TRICHLOROBENZENE 1,2-DICHLOROBENZENE 1,3-DICHLOROBENZENE 1,4-DICHLOROBENZENE	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U 9 U	10 U 10 U 10 U 10 U
2,4,5-TRICHLOROPHENOL 2,4,6-TRICHLOROPHENOL 2,4-DICHLOROPHENOL 2,4-DIMETHYLPHENOL	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U	10 U 10 U 10 U 10 U
,4-DINITROPHENOL ,4-DINITROTOLUENE ,6-DINITROTOLUENE -CHLORONAPHTHALENE	48 U 10 U 10 U 10 U	47 U 9 U 9 U 9 U	47 U 9 U 9 U 9 U	48 U 10 U 10 U 10 U

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2
VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Semivolatiles B270 (in µg/L)			1	1
2-CHLOROPHENOL 2-METHYLNAPHTHALENE 2-METHYLPHENOL 2-NITROANILINE	10 U 10 U 10 U 19 U	9 U 9 U 9 U 19 U	9 U 9 U 9 U 19 U	10 U 10 U 10 U 10 U 19 U
2-NITROPHENOL 3,3'-DICHLOROBENZIDINE 3-NITROANILINE 4,6-DINITRO-2-METHYLPHENOL	19 U 19 U 19 U 48 U	19 U 19 U 19 U 47 U	19 U 19 U 19 U 47 U	19 U 19 U 19 U 19 U 48 U
4 - BROMOPHENYL - PHENYLETHER 4 - CHLORO - 3 - METHYLPHENOL 4 - CHLOROANILINE 4 - CHLOROPHENYL - PHENYLETHER	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U	10 U 10 U 10 U 10 U
4 - METHYLPHENOL 4 - NITROANILINE 4 - NITROPHENOL ACENAPHTHENE	10 U 19 U 19 U 10 U	9 U 19 U 19 U 9 U	9 U 19 U 9 U	10 U 19 U 19 U 10 U
ACENAPHTHYLENE ANTHRACENE BENZO (A) ANTHRACENE BENZO (A) PYRENE	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U	10 U 10 U 10 U 10 U
BENZO(B)FLUORANTHENE BENZO(G,H,I)PERYLENE BENZO(K)FLUORANTHENE BIS(2-CHLOROETHOXY)METHANE	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U 9 U	10 U 10 U 10 U 10 U

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2

VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Semivolatiles B270 (in μg/L)		-	1	1
BIS (2-CHLOROETHYL) ETHER BIS (2-CHLOROISOPROPYL) ETHER BIS (2-ETHYLHEXYL) PHTHALATE BUTYLBENZYLPHTHALATE	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U 9 U	10 U 10 U 10 U 10 U
CARBAZOLE CHRYSENE DI-N-BUTYLPHTHALATE DI-N-OCTYLPHTHALATE	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U 9 U	10 U 10 U 10 U 10 U
DIBENZ (A,H) ANTHRACENE DIBENZOFURAN DIETHYLPHTHALATE DIMETHYLPHTHALATE	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U 9 U	10 U 10 U 10 U 10 U
FLUORANTHENE FLUORENE HEXACHLOROBENZENE HEXACHLOROBUTADIENE	10 U 10 U 10 U 10 U	9 U 9 U 9 U 9 U	9 U 9 U 9 U	10 U 10 U 10 U 10 U
HEXACHLOROCYCLOPENTADIENE HEXACHLOROETHANE INDENO(1,2,3-CD)PYRENE ISOPHORONE	48 U 10 U 10 U 10 U	47 U 9 U 9 U 9 U	47 U 9 U 9 U 9 U	48 U 10 U 10 U 10 U
N-NITROSO-DI-N-PROPYLAMINE N-NITROSODIMETHYLAMINE N-NITROSODIPHENYLAMINE NAPHTHALENE	10 U 10 U 10 U 10 U	9 U 9 U 9 U	9 U 9 U 9 U 9 U	10 U 10 U 10 U 10 U

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2

VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Semivolatiles B270 (in μg/L)			.1	1
NITROBENZENE PENTACHLOROPHENOL PHENANTHRENE PHENOL	10 U 19 U 10 U 10 U	9 U 19 U 9 U 9 U	9 U 19 U 9 U 9 U	10 U 19 U 10 U 10 U
PYRENE TOTAL HIGH MOLECULAR PAHS TOTAL LOW MOLECULAR PAHS TOTAL PAHS	10 U U U U	9 U U U U	9 U U U	10 U U U U
Pesticides (in µg/L)				L
4,4'-DDD 4,4'-DDE 4,4'-DDT ALDRIN	0.1 U 0.1 U 0.1 U 0.1 U	0.09 U 0.09 U 0.09 U 0.09 U	0.09 U 0.09 U 0.09 U 0.09 U 0.05 U	0.1 U 0.1 U 0.1 U 0.1 U 0.05 U
ALPHA - BHC ALPHA - CHLORDANE BETA - BHC DELTA - BHC	0.05 U 0.05 U 0.05 U 0.05 U	0.05 U 0.05 U 0.05 U 0.05 U	0.05 U 0.05 U 0.05 U 0.05 U	0.05 U 0.05 U 0.05 U 0.05 U
DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE	0.1 U 0.05 U 0.1 U 0.1 U	0.09 U 0.05 U 0.09 U 0.09 U	0.09 U 0.05 U 0.09 U 0.09 U	0.1 U 0.05 U 0.1 U 0.1 U
ENDRIN ENDRIN ALDEHYDE GAMMA-BHC	0.1 U 0.1 U 0.05 U	0.09 U 0.09 U 0.05 U	0.09 U 0.09 U 0.05 U	0.1 U 0.1 U 0.05 U

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2
VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Pesticides (in μg/L)				<u> </u>
GAMMA-CHLORDANE HEPTACHLOR HEPTACHLOR EPOXIDE METHOXYCHLOR	0.05 U 0.05 U 0.05 U 0.05 U	0.05 U 0.05 U 0.05 U 0.05 U	0.05 U 0.05 U 0.05 U 0.05 U 0.5 U	0.05 U 0.05 U 0.05 U 0.05 U
TOXAPHENE TOTAL BHCS TOTAL CHLORDANES TOTAL DDTS	1 U U U U	0.9 U U U U	0.9 U U U U	1 U U U U
PCBs (in μg/L)			1	
AROCLOR-1016 AROCLOR-1221 AROCLOR-1232 AROCLOR-1242	0.5 UJ 1 UJ 0.5 UJ 0.5 U	0.5 UJ 0.9 UJ 0.5 UJ 0.5 U	0.5 UJ 0.9 UJ 0.5 UJ 0.5 U	0.5 UJ 1 UJ 0.5 UJ 0.5 U
AROCLOR - 1248 AROCLOR - 1254 AROCLOR - 1260	0.5 U 0.5 U 0.5 U	0.5 U 0.5 U 0.5 U	0.5 U 0.5 U 0.5 U	0.5 U 0.5 U 0.5 U
Petroleum Indicators(in mg/L)				
ASOLINE RANGE ORGANICS	0.05 U	0.05 U	0.05 U	0.05 U
etroleum Indicators - Silica	Gel (in mg/L)			
DIESEL C10-C24 OTOR OIL C24-C36	0.1 H 0.3 UJ	0.05 U 0.3 U	0.05 U 0.3 U	0.05 UJ 0.3 UJ

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2
VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
CLP Metals (in µg/L)				1
ALUMINUM	310	1,100	560	180 UJ
ANTIMONY	60.0 U	36.0 UJ	60.0 U	60.0 U
ARSENIC	150 J	37.0 J	34.0 J	60.0
BARIUM	22.0	37.0	32.0	94.0
BERYLLIUM	2.0 U	2.0 U	2.0 U	2.0 U
CADMIUM	5.0 U	5.0 U	5.0 U	5.0 U
CALCIUM	19,000	30,000	29,000	73,000
CHROMIUM	10.0 U	10.0 U	10.0 U	10.0 U
COBALT	20.0 U	20.0 U	20.0 U	2.1 J
COPPER	2.6	3.4	3.7	3.2
IRON	240	1,100	570	320
LEAD	3.0 U	3.0 U	3.0 U	7.5 UJ
MAGNESIUM	37,000 J	53,000 J	51,000 J	180,000
MANGANESE	160 J	300 J	290 J	790
MERCURY	0.20 U	0.21	0.24	0.20 U
MOLYBDENUM	73.0	92.0	90.0	50.0 UJ
NICKEL	13.0	17.0	17.0	13.0
POTASSIUM	24,000 J	42,000 J	41,000 J	79,000
SELENIUM	3.6 UJ	5.0 U	5.0 U	5.0 U
SILVER	5.0 U	5.0 U	5.0 U	5.0 U
SODIUM	1,400,000	1,600,000	1,700,000	2,800,000
THALLIUM	5.0 U	3.9 J	5.0 U	2.2 UJ
VANADIUM	5.3 J	18.0	16.0	1.3 J
ZINC	20.0 U	21.0	13.0 J	9.8 UJ

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-2
VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	GW001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	
Matrix				04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Hexavalent Chromium (in $\mu g/L$ )				1
HEXAVALENT CHROMIUM	0.010 U	0.010 U	0.010 U	0.010 U
Anions, Solids, Sulfides, and	TOC (in mg/L)		1	1
TOTAL ORGANIC CARBON TOTAL SUSPENDED SOLIDS	13.0 5.0 U	13.0 38.0	13.0 26.0	13.0 NA
Dioxin (in ng/L)			1	
1,2,3,4,6,7,8,9-OCDD 1,2,3,4,6,7,8-HPCDD 1,2,3,4,6,7,8-HPCDF 1,2,3,4,7,8,9-HPCDF	NA NA NA NA	NA NA NA NA	NA NA NA NA	26 J 26 U 26 U 26 U
1,2,3,4,7,8-HXCDD 1,2,3,4,7,8-HXCDF 1,2,3,6,7,8-HXCDD 1,2,3,6,7,8-HXCDF	NA NA NA NA	NA NA NA NA	NA NA NA NA	26 U 26 U 26 U 26 U
1,2,3,7,8,9-HXCDD 1,2,3,7,8,9-HXCDF 1,2,3,7,8-PECDD 1,2,3,7,8-PECDF	NA NA NA NA	NA NA NA NA	NA NA NA NA	26 U 26 U 26 U 26 U
2,3,4,6,7,8-HXCDF 2,3,4,7,8-PECDF 2,3,7,8-TCDD 2,3,7,8-TCDF	NA NA NA NA	NA NA NA NA	NA NA NA NA	26 U 26 U 26 U 26 U
HEPTACHLORODIBENZO-P-DIOXIN HEPTACHLORODIBENZOFURAN	NA NA	NA NA	NA NA	26 U 26 U

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

**APPENDIX G-2** 

## VALIDATED SITE 30 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Point ID	G <b>W</b> 001	GW002	GW002	GW003
Sample ID	04530GW001	04530GW002	04530GW002D	04530GW003
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/26/2003	11/26/2003	11/26/2003	11/25/2003
Dioxin (in µg/L)				
HEXACHLORODIBENZO-P-DIOXIN HEXACHLORODIBENZOFURAN OCTACHLORODIBENZOFURAN PENTACHLORODIBENZO-P-DIOXIN	NA NA NA NA	NA NA NA NA	NA NA NA NA	26 U 26 U 26 U 26 U 26 U
PENTACHLORODIBENZOFURAN TETRACHLORODIBENZO-P-DIOXIN TETRACHLORODIBENZOFURANS	NA NA NA	NA NA NA	NA NA NA	26 U 26 U 26 U

### Notes:

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-3
VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE
Sample ID	04530ER01	04530SB01	04530TB01	04530TB02
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003
Volatiles 8260 (in µg/L)	-	1	1	11/20/2003
1,1,1-TRICHLOROETHANE 1,1,2,2-TETRACHLOROETHANE 1,1,2-TRICHLOROETHANE 1,1-DICHLOROETHANE	NA NA NA NA	NA NA NA NA	0.5 U 0.5 U 0.5 U 0.5 U	1 UJ 1 UJ 1 UJ 1 UJ 1 UJ
1,1-DICHLOROETHENE 1,2-DICHLOROETHANE 1,2-DICHLOROETHENE (TOTAL) 1,2-DICHLOROPROPANE	NA NA NA NA	NA NA NA NA	0.5 U 0.5 U 0.5 U 0.5 U	1 UJ 1 UJ 1 UJ 1 UJ
2 - BUTANONE 2 - HEXANONE 4 - METHYL - 2 - PENTANONE ACETONE	NA NA NA NA	NA NA NA NA	10 U 10 U 10 U 10 U	10 UJ 10 UJ 10 UJ 10 UJ
BENZENE BROMODICHLOROMETHANE BROMOFORM BROMOMETHANE	NA NA NA NA	NA NA NA NA	0.5 U 0.5 U 1 U 1 U	1 UJ 1 UJ 1 UJ 1 UJ
CARBON DISULFIDE CARBON TETRACHLORIDE CHLOROBENZENE CHLOROETHANE	NA NA NA NA	NA NA NA NA	0.5 U 0.5 U 0.5 U 1 U	1 UJ 1 UJ 1 UJ 1 UJ
CHLOROFORM CHLOROMETHANE SIS-1,3-DICHLOROPROPENE DIBROMOCHLOROMETHANE	NA NA NA NA	NA NA NA NA	0.5 U 1 U 0.5 U 0.5 U	1 UJ 1 UJ 1 UJ 1 UJ

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-3

VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE
Sample ID	04530ER01	04530SB01	04530TB01	04530TB02
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003
Volatiles B260 (in μg/L)		1	1	
ETHYLBENZENE METHYLENE CHLORIDE STYRENE TETRACHLOROETHENE	NA NA 0.5 U NA NA 10 UJ NA NA 0.5 U NA NA 0.5 U NA NA 0.5 U		1 UJ 10 UJ 1 UJ 1 UJ 1 UJ	
TOLUENE TRANS-1,3-DICHLOROPROPENE TRICHLOROETHENE VINYL ACETATE	NA NA NA NA	NA NA NA NA	0.5 U 0.5 U 0.5 U 10 U	1 UJ 1 UJ 1 UJ 10 UJ
VINYL CHLORIDE XYLENE (TOTAL)	NA NA	NA NA	0.5 U 0.5 U	1 UJ 1 UJ
Semivolatiles 8270 (in µg/L)			<u> </u>	
1,2,4-TRICHLOROBENZENE 1,2-DICHLOROBENZENE 1,3-DICHLOROBENZENE 1,4-DICHLOROBENZENE	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA
2,4,5-TRICHLOROPHENOL 2,4,6-TRICHLOROPHENOL 2,4-DICHLOROPHENOL 2,4-DIMETHYLPHENOL	10 U 10 U 10 U 10 U	10 U NA 10 U NA 10 U NA 10 U NA		NA NA NA NA
, 4 - DINITROPHENOL , 4 - DINITROTOLUENE , 6 - DINITROTOLUENE - CHLORONAPHTHALENE	48 U 10 U 10 U 10 U	48 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures.

Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-3

VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	
Sample ID	04530ER01	04530SB01	04530TB01	04530TB02	
Matrix	WATER	WATER	WATER	WATER	
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003	
Semivolatiles 8270 (in µg/L)		1	I		
2-CHLOROPHENOL 2-METHYLNAPHTHALENE 2-METHYLPHENOL 2-NITROANILINE	TALENE 10 U NA NA 10 U NA				
2-NITROPHENOL 3,3'-DICHLOROBENZIDINE 3-NITROANILINE 4,6-DINITRO-2-METHYLPHENOL	19 U 19 U 19 U 48 U	19 U 19 U 19 U 48 U	NA NA NA NA	NA NA NA NA	
4-BROMOPHENYL-PHENYLETHER 4-CHLORO-3-METHYLPHENOL 4-CHLOROANILINE 4-CHLOROPHENYL-PHENYLETHER	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA	
4 METHYLPHENOL 4 NITROANILINE 4 NITROPHENOL ACENAPHTHENE	DANILINE 19 U		10 U NA 19 U NA 19 U NA 10 U NA		
ACENAPHTHYLENE ANTHRACENE BENZO (A) ANTHRACENE BENZO (A) PYRENE	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA	
BENZO(B) FLUORANTHENE BENZO(G,H,I) PERYLENE BENZO(K) FLUORANTHENE BIS(2-CHLOROETHOXY) METHANE	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA	

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-3

VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE 04530TB02	
Sample ID	04530ER01	04530SB01	04530TB01		
Matrix	WATER	WATER	WATER	WATER	
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003	
Semivolatiles B270 (in μg/L)				<u> </u>	
BIS (2-CHLOROETHYL) ETHER BIS (2-CHLOROISOPROPYL) ETHER BIS (2-ETHYLHEXYL) PHTHALATE BUTYLBENZYLPHTHALATE	10 U 10 U 10 U 10 U 10 U 10 U 10 U 10 U		NA NA NA NA	NA NA NA NA	
CARBAZOLE CHRYSENE DI-N-BUTYLPHTHALATE DI-N-OCTYLPHTHALATE	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA	
DIBENZ (A, H) ANTHRACENE DIBENZOFURAN DIETHYLPHTHALATE DIMETHYLPHTHALATE	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA	
FLUORANTHENE FLUORENE HEXACHLOROBENZENE HEXACHLOROBUTADIENE	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA	
HEXACHLOROCYCLOPENTADIENE HEXACHLOROETHANE INDENO(1,2,3-CD)PYRENE ISOPHORONE	48 U 10 U 10 U 10 U	48 U 10 U 10 U 10 U	10 U NA 10 U NA		
N-NITROSO-DI-N-PROPYLAMINE N-NITROSODIMETHYLAMINE N-NITROSODIPHENYLAMINE NAPHTHALENE	10 U 10 U 10 U 10 U	10 U 10 U 10 U 10 U	NA NA NA NA	NA NA NA NA	

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-3
VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE 04530TB02	
Sample ID	04530ER01	04530SB01	04530TB01		
Matrix	WATER	WATER	WATER	WATER	
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003	
Semivolatiles B270 (in µg/L)					
NITROBENZENE PENTACHLOROPHENOL PHENANTHRENE PHENOL	10 U 19 U 10 U 10 U	10 U 19 U 10 U 10 U	NA NA NA NA	NA NA NA NA	
PYRENE TOTAL HIGH MOLECULAR PAHS TOTAL LOW MOLECULAR PAHS TOTAL PAHS	10 U U U U	10 U U U U	NA NA NA NA	NA NA NA NA	
Pesticides (in µg/L)					
4,4'-DDD 4,4'-DDE 4,4'-DDT ALDRIN	0.1 U 0.1 U 0.1 U 0.05 U	0.1 U 0.1 U 0.1 U 0.1 U 0.05 U	NA NA NA NA	NA NA NA NA	
ALPHA - BHC ALPHA - CHLORDANE BETA - BHC DELTA - BHC	0.05 U 0.05 U 0.05 U 0.05 U	0.05 U 0.05 U 0.05 U 0.05 U	NA NA NA NA	NA NA NA NA	
DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE	0.1 U 0.05 U 0.1 U 0.1 U	0.1 U 0.05 U 0.1 U 0.1 U	NA NA NA NA	NA NA NA NA	
ENDRIN ENDRIN ALDEHYDE GAMMA-BHC	0.1 U 0.1 U 0.05 U	0.1 U 0.1 U 0.05 U	NA NA NA	NA NA NA	

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-3

VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE	
Sample ID	04530ER01	04530SB01	04530TB01	04530TB02	
Matrix	WATER	WATER	WATER	WATER	
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003	
Pesticides (in µg/L)		L	I.	<u> </u>	
GAMMA-CHLORDANE HEPTACHLOR HEPTACHLOR EPOXIDE METHOXYCHLOR	0.05 U 0.05 U 0.05 U 0.05 U	0.05 U 0.05 U 0.05 U 0.05 U	NA		
TOXAPHENE TOTAL BHCS TOTAL CHLORDANES TOTAL DDTS	1 U U U U	1 U U U U	NA NA NA NA	NA NA NA NA	
PCBs (in µg/L)		I .	I.		
AROCLOR-1016 AROCLOR-1221 AROCLOR-1232 AROCLOR-1242	0.5 UJ 1 UJ 0.5 UJ 0.5 U	0.5 UJ 1 UJ 0.5 UJ 0.5 U	NA NA NA NA	NA NA NA NA	
AROCLOR-1248 AROCLOR-1254 AROCLOR-1260	0.5 U 0.5 U 0.5 U	0.5 U NA 0.5 U NA 0.5 U NA		NA NA NA	
Petroleum Indicators(in mg/L)					
GASOLINE RANGE ORGANICS	0.7 G	0.05 U	NA	NA	
etroleum Indicators - Silica	Gel (in mg/L)				
DIESEL C10-C24 OTOR OIL C24-C36	0.03 J 0.3 U	0.03 J 0.3 UJ	NA NA	NA NA	

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

APPENDIX G-3

VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE
Sample ID	04530ER01	04530SB01	04530TB01	04530TB02
Matrix	WATER	WATER	WATER	WATER
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003
CLP Metals (in µg/L)			1	1
ALUMINUM ANTIMONY ARSENIC BARIUM	32.0 UJ 60.0 U 5.0 U 0.52 UJ	18.0 UJ 60.0 U 5.0 U 10.0 U	NA NA NA NA	NA NA NA NA
BERYLLIUM CADMIUM CALCIUM CHROMIUM	0.50 UJ 5.0 U 500 U 0.32 J	0.84 UJ 5.0 U 130 UJ 10.0 U	NA NA NA NA	NA NA NA NA
COBALT COPPER IRON LEAD	20.0 U 1.0 U 100 U 1.3 UJ	20.0 U 1.0 U 100 U 3.0 U	NA NA NA NA	AN AN AN
MAGNESIUM MANGANESE MERCURY MOLYBDENUM	500 U 10.0 U 0.20 U 5.2 UJ	280 J 1.3 J 0.20 U 20.0 U	NA NA NA NA	AA AA AA AA
NICKEL POTASSIUM SELENIUM SILVER	1.0 U 500 U 5.0 U 5.0 U	1.0 U 500 U 5.0 U 5.0 U	NA NA NA NA	NA NA NA NA
SODIUM THALLIUM VANADIUM ZINC	500 U 5.0 U 10.0 U 8.0 UJ	500 U 5.0 U 10.0 U 3.8 UJ	NA NA NA NA	NA NA NA NA

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

### **APPENDIX G-3**

## VALIDATED SITE 30 QUALITY CONTROL SAMPLE DATA

Point ID	QC SAMPLE	QC SAMPLE	QC SAMPLE	QC SAMPLE		
Sample ID	04530ER01	04530SB01 04530TB01		04530ER01 04530SB01		04530TB02
Matrix	WATER	WATER	WATER	WATER		
Sample Date	11/25/2003	11/25/2003	11/25/2003	11/26/2003		
Hexavalent Chromium (in $\mu$ g/)	J)					
HEXAVALENT CHROMIUM	0.010 UJ	0.010 U	NA	NA		

#### Notes:

U = Not detected with detection limit indicated, J = Estimated value, NA = Not analyzed  $\mu g/L$  = Micrograms per liter, mg/L = Milligrams per liter. Inorganic results less than 10 are reported to two significant figures and results greater than 10 are reported to three significant figures. Organic results less than 10 are reported to one significant figure and results greater than 10 are reported to two significant figures.

## **DATA VALIDATION REPORT**

Site:

**NWS Concord** 

Contract Task Order (CTO) No.:

G9016-0450302020709

Laboratory:

Curtis & Tompkins, Ltd.

Data Reviewer:

Richard Amano, Stacey Swenson, Erlinda Rauto, Pei Geng, Felomina

Teethreview NBORISOVA, THEMI 02/04/04

Tanguilig, Ming Hwang, and Steve Ziliak.

Firm/Proj. No:

Laboratory Data Consultants, Inc./11460A

Review Date:

January 27, 2004

Sample Delivery Group (SDG) No.:

169079

Sample Nos.:

04530SB001	04530SB004	04530SB001MSD	04530SB003MSD
04530SB001RE	04530SB004RE	04530SB001DUP	04530SB003MSRE
04530SB002	04530SB005	04530SB002MS	04530SB003MSDRE
04530SB002RE	04530SB005RE	04530SB002MSD	04530SB005MS
04530SB003*	04530SB001MS	04530SB003MS	04530SB005MSD

04530SB003RE\*

Matrix:

Soil

Collection Date(s):

November 24, 2003

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (March 1997), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (September 1998) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

Certified by Riehard Amano

Principal Chemist

<sup>\*</sup> Full Validation Sample

### DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (\*).

## **CLP Organic Parameters**

## \* Holding times

GC/MS instrument performance check

- \* Initial and continuing calibrations
- \* Blanks
- \* Surrogate recovery
- \* Matrix spike/matrix spike duplicate
- \* Laboratory control sample or blank spike
- \* Field duplicates
- \* Internal standard performance
  Target compound identification
  Tentatively identified compounds
  Compound quantitation
  - Compound quantitation Reported detection limits System performance
- \* Overall assessment of data for the SDG

## **CLP Inorganic Parameters**

- \* Holding times
- \* Initial and continuing calibrations
- \* Blanks
- \* Matrix spike
- \* Laboratory control sample or blank spike
- \* Field duplicates
- \* Matrix duplicates

ICP interference check sample

GFAA quality control

\* ICP serial dilution

Sample result verification

Analyte quantitation

Reported detection limits

Overall assessment of data for the SDG

## Non-CLP Organic and Inorganic Parameters

- \* Method compliance
- \* Holding times
- \* Initial and continuing calibrations
- \* Blanks
- \* Matrix spike/matrix spike duplicate
- \* Laboratory control sample or blank spike
- \* Field duplicates
- Matrix duplicates
- \* Surrogate recovery

Analyte quantitation

Reported detection limits

\* Overall assessment of data for the SDG

## DATA VALIDATION QUALIFIERS AND CODES

## **Data Validation Qualifiers**

- **UJ** Estimated nondetected result
- J Estimated detected result
- R Rejected result
- NJ Tentatively Identified Compound (TIC)

## **Data Validation Qualifier Codes**

- a Surrogate recovery exceedance
- b Laboratory method blank and common blank contamination
- c Calibration exceedance
- d Duplicate precision exceedance
- e Matrix spike/laboratory control sample (LCS) recovery exceedance
- f Field blank contamination
- g Quantification below reporting limit
- h Holding time exceedance
- i Internal standard exceedance
- j Other qualifications

TABLE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
SVOA	1	✓	✓	N/A	✓	pg. 6	pg. 6-7	1	N/A	pg. 7
Pesticide	<b>√</b>	<b>√</b>	pg. 9	N/A	✓	✓	pg. 9-10	N/A	N/A	pg. 10
PCB	✓	<b>√</b>	✓	N/A	✓	✓	pg. 12	N/A	N/A	pg. 13
Metals	<b>√</b>	N/A	pg. 15	N/A	✓	pg. 14	pg. 14	✓	N/A	pg. 16
TPHG	✓	✓	✓	N/A	1	1	✓	N/A	N/A	pg. 17
ТРНЕ	✓	✓	✓	N/A	✓	pg. 19	✓	N/A	N/A	pg. 20
CRVI	1	N/A	1	N/A	✓	✓	✓	N/A	N/A	pg. 22
TOC	✓	N/A	✓	N/A	✓	✓	✓	N/A	N/A	pg. 22
рН	<b>√</b>	N/A	N/A	✓	✓	1	1	N/A	N/A	pg. 22

 $\sqrt{}$  indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.

N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 04530DB003\* and 04530SB003RE\*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
SVOA	<b>√</b>	1	1	✓	1	✓	N/A	N/A
Pesticide	N/A	pg. 10	1	1	N/A	✓	N/A	N/A
PCB	N/A	1	<b>√</b>	✓	N/A	<b>√</b>	N/A	N/A
Metals	N/A	1	1	1	N/A	✓	1	N/A
TPHG	N/A	1	✓	1	N/A	✓	N/A	N/A
ТРНЕ	N/A	pg. 20-21	<b>√</b>	1	N/A	<b>√</b>	N/A	N/A
CRVI	N/A	1	<b>✓</b>	1	N/A	1	N/A	N/A
TOC	N/A	1	<b>√</b>	1	N/A	✓	N/A	N/A
рН	N/A	1	✓	1	N/A	1	N/A	N/A

 $\sqrt{\text{indicates that all quality control criteria}}$  were met for the parameter as specified in the prescribed methods and data validation guidelines.

N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

## **DATA ASSESSMENT**

## SEMIVOLATILE ORGANIC ANALYSIS (EPA SW 846 Method 8270C)

- I. Holding Times
- A. All criteria were met.  $\mathcal{T} = \mathcal{S}^{3}\mathcal{C}$
- II. Surrogate Recovery
- A. All criteria were met.
- III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)
- A. All criteria were met.
- IV. Blank Spike or Laboratory Control Sample (LCS)
- A. All criteria were met.
- V. Blank Contamination
- B. Due to method blank contamination, the following results are considered nondetected (UJb).
- -{ils
- Toluene (4.144) and 4-Hydroxy-4- 04530SB001 04530SB003\* 04530SB005 methyl-2-pentanone (4.992) in samples 04530SB002 04530SB004

The following compounds were detected in the associated method blanks at the concentrations noted below.

11C

Compound	Blank ID	Concentration
Toluene (4.144)	86524MB	232.4867 ug/Kg
4-Hydroxy-4-methyl-2-pentanone (4.992)	86524MB	1942.8229 ug/Kg

Detected results less than 10x the blank contamination were qualified.

### VI. Calibrations

- A. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJc).
  - N-Nitrosodimethylamine, Bis(2-chloroisopropyl)ether, Hexachlorocyclopentadiene, 4-Nitrophenol, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene in sample

04530SB004

Too many

• Hexachlorocyclopentadiene, Indeno(1,2,3-cd)pyrene,
Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene in samples

04530SB001 04530SB002 04530SB003\* 04530SB005

The following continuing calibrations had percent differences (%D) of >25%.

Calibration Date	Compound	%D
11/29/03 (12:42)	N-Nitrosodimethylamine	26
11/29/03 (12:42)	Bis(2-chloroisopropyl)ether	59
11/29/03 (12:42)	Hexachlorocyclopentadiene	27
11/29/03 (12:42)	4-Nitrophenol	32
11/29/03 (12:42)	Indeno(1,2,3-cd)pyrene	37
11/29/03 (12:42)	Dibenz(a,h)anthracene	36
11/29/03 (12:42)	Benzo(g,h,i)perylene	41
11/29/03 (11:56)	Hexachlorocyclopentadiene	27
11/29/03 (11:56)	Indeno(1,2,3-cd)pyrene	40
11/29/03 (11:56)	Dibenz(a,h)anthracene	37
11/29/03 (11:56)	Benzo(g,h,i)perylene	53

## VII. Internal Standards

A. All criteria were met.

## VIII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

## IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

no Js

All SVOA detected results reported below the RL

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

## Full Validation Criteria for Sample 04530SB003\*

## X. GC/MS Instrument Performance Checks

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS instrument performance checks. The samples were analyzed within 12 hours of the associated instrument performance check.

## XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

## XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

## XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

## XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

## PESTICIDE ANALYSIS (EPA SW 846 Method 8081A)

## I. Holding Times

A. All criteria were met.  $\int = 80^{\circ}$ 

## II. Surrogate Recovery

A. All criteria were met.

## III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

- A. The MS/MSD analysis was not performed for samples 04530SB001, 04530SB002, 04530SB003\*, and 04530SB005.
- B. All other criteria were met.

## IV. Blank Spike or Laboratory Control Sample (LCS)

A. All criteria were met.

#### V. Blank Contamination

A. All criteria were met.

#### VI. Calibrations

A. Due to continuing calibration problems, the following detected and nondetected results are qualified as estimated (Jc/UJc).

• 4,4' -DDT, Methoxychlor, Endosulfan II, Endrin aldehyde, and Endosulfan sulfate in sample 04530SB004

• 4,4° -DDT, Endrin aldehyde, and Methoxychlor in 04530SB002 04530SB005 samples 04530SB003\*

The following continuing calibrations had percent differences (%D) of > 15%.

Calibration Date	Column ID	Compound	<u>%D</u>
12/10/03	RTX-CLPI	4,4' -DDT	25
12/10/03	RTX-CLPI	Methoxychlor	24
12/10/03	RTX-CLPII	Endosulfan II	16
12/10/03	RTX-CLPII	4.4' -DDT	33
		, = = =	23

Calibration Date	Column ID	Compound	<u>%D</u>
12/10/03	RTX-CLPII	Endrin aldehyde	19
12/10/03	RTX-CLPII	Methoxychlor	25
12/10/03	RTX-CLPII	Endosulfan sulfate	18
12/11/03	RTX-CLPI	4,4' -DDT	24
12/11/03	RTX-CLPI	Endrin aldehyde	19
12/11/03	RTX-CLPI	Methoxychlor	25

### VII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

## VIII. Compound Identification

A. Due to confirmation problems, the following results are considered nondetected (UJj). Ya Mell

• 4,4' -DDT in sample

04530SB004

The result reported was detected below the RL, and a percent difference (%D) greater than 50% was noted in the analyte concentration between the quantitation column and the confirmation column. Further review of the data determined that the result reported was a false positive. The %Ds are listed below.

Sample ID	Compound	%D
04530SB004	4.4' -DDT	80

## IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

us Js

All pesticide detected results reported below the RL.

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

## Full Validation Criteria for Sample 04530SB003\*

## X. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

## XI. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

### POLYCHLORINATED BIPHENYL (PCB) ANALYSIS (EPA SW 846 Method 8082)

### I. Holding Times

A. All criteria were met.

### II. Surrogate Recovery

A. All criteria were met.

(\*) Recoverier fore & morrogates were polipher to me (146 2144) but

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. All criteria were met.

(\*) All criteria were met.

(\*) All criteria were met.

(\*) All criteria were met.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. All criteria were met.

V. Blank Contamination  $\mathcal{L} = \mathcal{L} = \mathcal{L}$ 

A. All criteria were met.

#### VI. Calibrations

A. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJc).

Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1254, Aroclor-1260, and Aroclor-1248 in samples
 Aroclor-1248 in samples
 04530SB001 04530SB002
 04530SB002
 04530SB004 04530SB005

The following continuing calibrations had percent differences (%D) of >15%.

Calibration Date	Column ID	Compound	<u>%D</u>
12/2/03 (18:07)	RTX-CLP11	Aroclor-1016	20
12/2/03 (18:07)	RTX-CLP11	Aroclor-1260	20
12/2/03 (18:35)	RTX-CLP11	Aroclor-1248	21
12/2/03 (03:34)	RTX-CLP11	Aroclor-1248	16
12/2/03 (11:51)	RTX-CLP11	Aroclor-1248	19

#### VII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

#### VIII. Compound Identification

A. All criteria were met.

#### IX. Other Qualifications

uo Js

- A. The following results are qualified as estimated (Jg).
  - All PCB detected results reported below the RL

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530SB003\*

### X. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### XI. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

### METALS ANALYSIS (EPA SW 846 Methods 6010B/6020/7000)

#### I. Holding Times

A. All criteria were met.

#### II. Calibrations

A. Due to calibration problems, the following detected results are qualified as estimated (Jc).

• Lead in samples 04530SB001 04530SB003\* 04530SB004 04530SB005 04530SB002

The CRI (12/5/03 06:51) percent recovery for Lead was 66%, less than the control limits of 75-125%.

B. Due to calibration problems, the following detected results are estimated (Jc).

• Antimony in sample 04530SB001

• Thallium in samples 04530SB001 04530SB004

• Potassium in samples 04530SB001 04530SB003\* 04530SB004 04530SB005

04530SB002

The CRI (12/5/03 06:51) percent recoveries for Antimony and Thallium were 130% and 138%, respectively, and the CRI (12/8/03 11:49) percent recovery for Potassium was 140%, above the control limits of 75-125%.

#### III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Mercury in samples 04530SB004 04530SB005

• Thallium in sample 04530SB004

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

 $\begin{array}{c|cccc} \underline{Analyte} & \underline{Blank \ ID} & \underline{Concentration} \\ \underline{Mercury} & \underline{ICB/CCB} & 0.113 \ ug/L \\ \underline{Thallium} & \underline{ICB/CCB} & 3.57 \ ug/L \end{array}$ 

Detected results less than 5x the maximum blank contamination were qualified.

### IV. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

- A. Due to a severe problem in the MS/MSD analysis, the following detected results are estimated and the nondetected results are rejected (Je/Re).
  - Antimony in samples 04530SB001 04530SB003\* 04530SB004 04530SB005 04530SB002

The recoveries that did not meet the QC limits are listed below.

Sample ID	<u>Analyte</u>	<u>MS %R</u>	MSD %R	QC Limits	<u>RPD</u>	QC Limits
04530SB001	Antimony	20	22	75-125%	-	_

Spike recoveries below 30% indicate that detects may be biased low and false nondetects may have been reported.

- B. Due to accuracy problems in the MS analysis, the following detected and nondetected results are qualified as estimated (Je/UJe).
  - Cadmium, Calcium, Lead, 04530SB001 04530SB003\* 04530SB004 04530SB005 and Nickel in samples 04530SB002

The recoveries that did not meet the QC limits are listed below.

Sample ID	<b>Analyte</b>	<u>MS %R</u>	MSD %R	QC Limits	RPD	<b>QC</b> Limits
04530SB001	Cadmium	70	72	75-125%	-	-
04530SB001	Calcium	70	-	75-125%	-	-
04530SB001	Lead	50	62	75-125%	-	-
04530SB001	Nickel	63	-	75-125%	_	-

Spike recoveries between 30-74% indicate that detects may be biased low and false nondetects may have been reported.

- B. Due to accuracy problems in the MS/MSD analysis, the following detected results are qualified as estimated (Je).
  - Potassium in samples 04530SB001 04530SB003\* 04530SB004 04530SB005 04530SB002

The recoveries that did not meet the QC limits are listed below.

Sample ID	<u>Analyte</u>	<u>MS %R</u>	MSD %R	QC Limits	<u>RPD</u>	QC Limits
04530SB001	Potassium	-	134	75-125%	-	_

Spike recoveries above 125% indicate that detected results may be biased high.

#### V. Matrix Duplicate (DUP)

A. The DUP analysis was not performed for this SDG.

#### VI. Laboratory Control Sample (LCS)

A. All criteria were met.

#### VII. ICP Serial Dilution

A. All criteria were met.

#### VIII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

#### IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All metals results above the IDL but below the RL

Results above the IDL but below the RL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530SB003\*

### X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

## XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. Graphite Furnace Atomic Absorption analysis was not utilized in this SDG.

#### XII. ICP Interference Check Sample

A. The ICSA analysis was not performed for this SDG.

## TPH GASOLINE (TPHG) ANALYSIS (EPA SW 846 Method 8015)

A.	All criteria were met.
II.	Surrogate Recovery
A.	All criteria were met.
III.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	All criteria were met.
IV.	Blank Spike or Laboratory Control Sample (LCS)
A.	All criteria were met.
v.	Blank Contamination
A.	All criteria were met.
VI.	Calibrations
A.	All criteria were met.
VII.	Field Duplicate
A.	No field duplicate samples were identified in this SDG.
VIII.	Other Qualifications
A.	The following results are qualified as estimated (Jg).
	• All TPHG detected results reported below the Tetra Tech EMI required report limit (RL)
	Detected results reported below the RL are considered to be qualitatively acceptable, but

quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

I.

**Holding Times** 

#### Full Validation Criteria for Sample 04530SB003\*

### IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

### X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

### XI. Compound Identification

A. Target compound identification was considered to be correct for sample 04530SB003\*.

## TPH EXTRACTABLE (TPHE) ANALYSIS (EPA SW 846 Method 8015)

I.	Holding Times		
A.	All criteria were met.		
II.	Surrogate Recovery		
A.	All criteria were met.		
III.	Matrix Spike/Matrix Spike Dup	olicate (MS/MSD)	
A.	All criteria were met.		
IV.	Blank Spike or Laboratory Con	atrol Sample (LCS)	
A.	All criteria were met.		
v.	Blank Contamination		
A.	Due to method blank contamination	on, the following results are considered	I nondetected (UJb).
	• TPH as diesel in samples	04530SB004RE	04530SB005RE
	The following compounds were on noted below.	detected in the associated method blanks	s at the concentrations
	Compound TPH as diesel	Blank ID 86518MB	Concentration 0.21 mg/Kg
	Detected results less than 5x the	blank contamination were qualified.	3 3
<b>37</b> T	C-Ph. and a second		
VI.	Calibrations		
A.	All criteria were met.		
VII.	Field Duplicate		
A.	No field duplicate samples were i	dentified in this SDG.	

#### VIII. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All TPHE detected results reported below the Tetra Tech EMI required report limit (RL)

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

- B. The following results are qualified as estimated (H).
  - All TPHE detected results flagged with a "H" by the laboratory.

Detected results flagged H by the laboratory indicate that a fuel pattern was present. however it is in the heavier hydrocarbon end of the detected compounds range.

- C. The following results are qualified as estimated (M).
  - All TPHE detected results flagged with a "M" by the laboratory.

Detected results flagged M by the laboratory indicate that the standard fuel pattern resembles motor oil.

#### Full Validation Criteria for Samples 04530GW002\* and 04530GW002RE\*

#### IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

#### XI. Compound Identification

- A. Target compound identification was considered to be correct for samples 04530SB003\* and 04530SB003RE\*.
- B. Due to identification problems, the following results were raised to the Required Limit (RL) and are reported as nondetected (UJj).
  - TPH as diesel in sample

04530SB005RE

The result reported was less than 1/2 the RL. It is the opinion of the reviewer that the positive results reported by the laboratory for the compounds listed above are both qualitatively and quantitatively unacceptable.

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#### NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic and physical parameters were analyzed for; Hexavalent Chromium, Total Organic Carbon (TOC), and pH.

- I. Holding Times
- A. All criteria were met.
- II. Calibrations
- A. All criteria were met.
- III. Blank Contamination
- A. All criteria were met.
- IV. Matrix Spike (MS)
- A. All criteria were met.
- V. Matrix Duplicate (DUP)
- A. All criteria were met.
- VI. Laboratory Control Sample (LCS)
- A. All criteria were met.
- VII. Field Duplicate
- A. No field duplicate samples were identified in this SDG.

#### VIII. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All Non-CLP inorganic and physical analysis results above the IDL and below the RL.

Results above the IDL and below the RL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

### Full Validation Criteria for Sample 04530SB003\*

## VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### OVERALL ASSESSMENT OF DATA

## I. Method Compliance and Additional Comments

- A. All analyses were conducted within all specifications of the requested methods with the exceptions listed below.
  - For the pesticide analysis, the MS/MSD analysis was not performed for samples 04530SB001, 04530SB002, 04530SB003\*, and 04530SB005.
  - For the metals analysis, the DUP and ICSA analyses were not performed for this SDG.

### II. Usability

#### Semivolatile Organic Analysis

- A. No results for semivolatile analysis were rejected in this SDG.
- B. Due to problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to method blank contamination problems, Toluene (4.144) and 4-Hydroxy-4-methyl-2-pentanone (4.992) were qualified nondetect in five samples.
  - Due to continuing calibration %D problems, N-Nitrosodimethylamine, Bis(2-chloroisopropyl)ether, and 4-Nitrophenol nondetected results were qualified as estimated in one sample and Hexachlorocyclopentadiene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene nondetected results were qualified as estimated in five samples.
  - All detected results reported below the RL were qualified as estimated.
  - All tentatively identified compounds were qualified (NJ).
- C. No samples were reextracted or reanalyzed for semivolatile analysis in this SDG.

#### **Pesticide Analysis**

- A. No results for pesticide analysis were rejected in this SDG.
- B. Due to instrument calibration and compound identification problems in the pesticide analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to continuing calibration %D problems, 4,4' -DDT, Endrin aldehyde, and Methoxychlor results were qualified as estimated in four samples and Endosulfan II and Endosulfan sulfate nondetected results were qualified as estimated in one sample.
  - Due to compound identification problems, 4,4' -DDT detected results were qualified as nondetected in one sample.
  - All detected results reported below the RL were qualified as estimated.

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C. No samples were reextracted or reanalyzed for pesticide analysis in this SDG.

#### **PCB** Analysis

- A. No results for PCB analysis were rejected in this SDG.
- B. Due to instrument calibration problems in the pesticide analysis, several samples were qualified as estimated. The findings were as follows:
  - Due continuing calibration %D problems, Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1254, Aroclor-1260, and Aroclor-1248 nondetected results were qualified as estimated in three samples and Aroclor-1248 nondetected results were qualified as estimated in two samples.
  - All detected results reported below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for PCB analysis in this SDG.

#### **Metals Analysis**

- A. Due to severe problems in the MS/MSD in the metals analysis, selected sample results were rejected. The findings were as follows:
  - Due to MS/MSD recovery problems, Antimony nondetected results were rejected in samples 04530SB002, 04530SB003\*, 04530SB004, and 04530SB005.
- B. Due to instrument calibration, calibration and method blank contamination, and MS/MSD problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to CRI standard recovery problems, Potassium and Lead detected results were qualified as estimated in five samples, Antimony detected results were qualified as estimated in one sample, and Thallium detected results were qualified as estimated in two samples.
  - Due to calibration and method blank contamination problems, Mercury was qualified nondetect in two samples and Thallium was qualified nondetect in one sample.
  - Due to MS/MSD recovery problems, Antimony detected results were qualified as
    estimated in one sample, Cadmium results and Calcium, Lead, Nickel, and Potassium
    detected results were qualified as estimated in five samples.
  - All detected results reported above the IDL but below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for metals analysis in this SDG.

### **TPH Gasoline Analysis**

- A. No results for TPH gasoline analysis were rejected in this SDG.
- B. Due to problems in the TPH gasoline analysis, several samples were qualified as estimated. The findings were as follows:

• All detected results reported below the Tetra Tech EMI required report limit (RL) were qualified as estimated.

B f.

No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG.

## **TPH Extractable Analysis**

- A. No results for TPHE analysis were rejected in this SDG.
- B. Due to method blank contamination and compound identification problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to method blank contamination problems, TPH as diesel was qualified nondetect in two samples.
  - Due to compound identification problems, TPH as diesel results were qualified as nondetected in one sample.
  - All detected results reported below the Tetra Tech EMI required report limit (RL) were qualified as estimated.
  - All detected results flagged with a "H" or "M" by the laboratory were qualified as estimated.
- C. Samples 04530SB001, 04530SB002\*, 04530SB003, 04530SB004, and 04530SB005 were reanalyzed for silica gel cleanup. For samples 04530SB001, 04530SB002\*, 04530SB003, 04530SB004, and 04530SB005, all TPHE results should not be considered usable. The TPHE results for samples 04530SB001RE, 04530SB002RE\*, 04530SB003RE, 04530SB004RE, and 04530SB005RE should be considered the most usable.

## Non-CLP Inorganic and Physical Analysis

- A. No results for non-CLP inorganic and physical analysis were rejected in this SDG.
  - Due to problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:
    - All detected results reported above the IDL but below the RL were qualified as estimated.

No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the cursory and full data validation all other results are considered valid and usable for all purposes.

#### DATA VALIDATION REPORT

Site:

**NWS** Concord

Contract Task Order (CTO) No.:

G9016-0450302020709

Laboratory:

Curtis & Tompkins, Ltd.

Data Reviewer:

Richard Amano, Stacey Swenson, Erlinda Rauto, Pei Geng, Felomina

Tanguilig, Ming Hwang, and Steve Ziliak.

Firm/Proj. No:

Laboratory Data Consultants, Inc./11460C

Review Date:

January 27, 2004

Sample Delivery Group (SDG) No.:

169111

Sample Nos.:

04530ER01

04530SB01

04530GW003RE

04530ER01MS

Techneview N. Bopisova, THEMI 02/04/04

04530GW003

04530ER01RE

04530SB01RE

04530ER01MSD

04530TB01

\* Full Validation Sample

Matrix:

Water

Collection Date(s):

November 25, 2003

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (March 1997), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (September 1998) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

ertified by Richard Amano

Principal Chemist

#### DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (\*).

### **CLP Organic Parameters**

## **CLP Inorganic Parameters**

- Holding times GC/MS instrument performance check
- Initial and continuing calibrations
- **Blanks**
- Surrogate recovery
- Matrix spike/matrix spike duplicate
- Laboratory control sample or blank spike
- Field duplicates
- Internal standard performance Target compound identification Tentatively identified compounds Compound quantitation Reported detection limits System performance

Overall assessment of data for the SDG

- Holding times
- \* Initial and continuing calibrations
- **Blanks**
- Matrix spike
- Laboratory control sample or blank spike
- Field duplicates
- Matrix duplicates

ICP interference check sample

GFAA quality control

ICP serial dilution

Sample result verification

Analyte quantitation

Reported detection limits

Overall assessment of data for the SDG

#### Non-CLP Organic and Inorganic Parameters

- Method compliance
- Holding times
- Initial and continuing calibrations
- Blanks
- Matrix spike/matrix spike duplicate
- Laboratory control sample or blank spike
- Field duplicates
- Matrix duplicates
- Surrogate recovery

Analyte quantitation

Reported detection limits

Overall assessment of data for the SDG

### DATA VALIDATION QUALIFIERS AND CODES

### **Data Validation Qualifiers**

- **UJ** Estimated nondetected result
- J Estimated detected result
- R Rejected result
- NJ Tentatively Identified Compound (TIC)

### **Data Validation Qualifier Codes**

- a Surrogate recovery exceedance
- **b** Laboratory method blank and common blank contamination
- c Calibration exceedance
- d Duplicate precision exceedance
- e Matrix spike/laboratory control sample (LCS) recovery exceedance
- f Field blank contamination
- g Quantification below reporting limit
- h Holding time exceedance
- i Internal standard exceedance
- j Other qualifications

TABLE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	1	✓	✓	N/A	pg. 6	pg. 6	✓	✓	N/A	pg. 7
SVOA	1	✓	N/A	N/A	✓	1	✓	1	N/A	pg. 8-9
Pesticide	1	<b>√</b>	N/A	N/A	✓	<b>√</b>	✓	N/A	N/A	pg. 10-11
PCB	1	<b>√</b>	N/A	N/A	1	✓	pg. 12	N/A	N/A	pg. 13
Metals	1	N/A	✓	N/A	1	pg. 14	pg. 14	✓	N/A	pg. 15
ТРНС	1	1	✓	N/A	1	✓	✓	N/A	N/A	pg. 16-17
ТРНЕ	pg. 18	1	N/A	N/A	✓	1	✓	N/A	N/A	pg. 18-19
CRVI	pg. 20	N/A	✓	N/A	1	1	✓	N/A	N/A	pg. 20-21
TOC	1	N/A	1	N/A	✓	1	1	N/A	N/A	pg. 20-21

#### Notes:

 $\sqrt{}$  indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.

N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) None

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SVOA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pesticide	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Metals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPHG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ТРНЕ	N/A	pg. 19	N/A	N/A	N/A	N/A	N/A	N/A
CRVI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

#### Notes:

 $\sqrt{}$  indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.

N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

## DATA ASSESSMENT

## **VOLATILE ORGANIC ANALYSIS (EPA SW 846 Method 8260B)**

I.	Holding Times
A.	All criteria were met.
II.	Surrogate Recovery
A.	All criteria were met.
III.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	All criteria were met.
IV.	Blank Spike or Laboratory Control Sample (LCS)
A.	The LCS analysis was not performed for this SDG.
V.	Blank Contamination
A.	Due to common laboratory contamination, the following results are considered nondetected (UJb).
	• Methylene chloride in sample 04530TB01
	Acetone, Methylene chloride, and 2-Butanone are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.
VI.	Calibrations
A.	All criteria were met.
VII.	Internal Standards
A.	All criteria were met.
VIII.	Field Duplicate

No field duplicate samples were identified in this SDG.

A.



## IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All VOA detected results reported below the RL.

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

# SEMIVOLATILE ORGANIC ANALYSIS (EPA SW 846 Method 8270C)

I.	Holding Times
A.	All criteria were met.
II. A.	Surrogate Recovery  All criteria were met.
III.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	The MS/MSD analysis was not performed for this SDG due to insufficient sample availability.
IV.	Blank Spike or Laboratory Control Sample (LCS)
A.	All criteria were met.  Recoveries for 4- Nitropheleol are high (118 x 109).  Blank Contamination  Blank Contamination  Blank Contamination  Recoveries for 4- Nitropheleol are high (118 x 109).  Blank Contamination
V.	Blank Contamination But all raceipes are not made
A.	All criteria were met.
VI.	Calibrations
A.	All criteria were met.
VII.	Internal Standards
A.	All criteria were met.
VIII.	Field Duplicate
A.	No field duplicate samples were identified in this SDG.
IX.	Other Qualifications
A.	The following results are qualified as estimated (Jg).
	All SVOA detected results reported below the RL

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Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

#### PESTICIDE ANALYSIS (EPA SW 846 Method 8081A)

## I. **Holding Times** A. All criteria were met. П. **Surrogate Recovery** A. All criteria were met. III. Matrix Spike/Matrix Spike Duplicate (MS/MSD) A. The MS/MSD analysis was not performed for this SDG due to insufficient sample availability. IV. Blank Spike or Laboratory Control Sample (LCS) A. All criteria were met. V. **Blank Contamination** A. All criteria were met. VI. **Calibrations** A. All criteria were met. VII. **Field Duplicate** A. No field duplicate samples were identified in this SDG. VIII. **Compound Identification** A. All criteria were met.

#### IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All pesticide detected results reported below the RL.

9

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

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## POLYCHLORINATED BIPHENYL (PCB) ANALYSIS (EPA SW 846 Method 8082)

### I. Holding Times

A. All criteria were met.

## II. Surrogate Recovery

A. All criteria were met.

### III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The MS/MSD analysis was not performed for this SDG due to insufficient sample availability.

## IV. Blank Spike or Laboratory Control Sample (LCS)

A. All criteria were met.

#### V. Blank Contamination

A. All criteria were met.

#### VI. Calibrations

A. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJc).

• Aroclor-1016, Aroclor-1221, and Aroclor-1232 in samples	04530ER01	04530SB01
	04530GW003	

The following continuing calibrations had percent differences (%D) of >15%.

Calibration Date	Column ID	<u>Compound</u>	<u>%D</u>
12/3/03	RTX-CLP1	Aroclor-1016	19

### VII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

### VIII. Compound Identification

A. All criteria were met.

## IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All PCB detected results reported below the RL

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

### METALS ANALYSIS (EPA SW 846 Methods 6010B/6020/7000)

## I. Holding Times

A. All criteria were met.

#### II. Calibrations

- A. Due to calibration problems, the following detected results are estimated (Jc).
  - Thallium in sample 04530GW003

The CRI (12/9/03 08:06) percent recovery for Thallium was 145%, above the control limits of 75-125%.

#### III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

Aluminum and Zinc in samples	04530ER01	04530GW003	04530SB01
• Thallium in sample	04530GW003		
Barium in sample	04530ER01		
• Beryllium in samples	04530ER01	04530SB01	
• Calcium in sample	04530SB01		
• Lead and Molybdenum in samples	04530ER01	04530GW003	

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

<u>Analyte</u>	Blank ID	Concentration, ug/L
Aluminum	PB	39
Thallium	PB	4.4
Barium	ICB/CCB	0.494
Beryllium	ICB/CCB	1.35
Calcium	ICB/CCB	26.79
Lead	ICB/CCB	2.75
Zinc	ICB/CCB	2.81
Molybdenum	ICB/CCB	10.7

Detected results less than 5x the maximum blank contamination were qualified.

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## IV. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. All criteria were met.

#### V. Matrix Duplicate (DUP)

A. The DUP analysis was not performed for this SDG.

### VI. Laboratory Control Sample (LCS)

A. All criteria were met.

#### VII. ICP Serial Dilution

A. The ICP serial dilution analysis was not performed for this SDG.

### VIII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

### IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All metals results above the IDL but below the RL

Results above the IDL but below the RL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

# TPH GASOLINE (TPHG) ANALYSIS (EPA SW 846 Method 8015)

I.	Holding Times
A.	All criteria were met.
II.	Surrogate Recovery
A.	All criteria were met.
III.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	All criteria were met.
IV.	Blank Spike or Laboratory Control Sample (LCS)
A.	All criteria were met.
v.	Blank Contamination
A.	All criteria were met.
VI.	Calibrations
A.	All criteria were met.
VII.	Field Duplicate
A.	No field duplicate samples were identified in this SDG.
VIII.	Other Qualifications
~ A-Y-	The following results are qualified as estimated (Jg).
<u> </u>	
	All TPHG detected results reported below the Tetra Tech EMI required report limit (RL)
	Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.
<b>B</b> .	The following results are qualified as estimated (G). The 7+EMI SOW requires
169111.REP 1/28/2004	The following results are qualified as estimated (G).  The 7+EMI SOW requires  That all matching  had patterns for  pasoline be flapped  with "G"

All TPHG detected results flagged with a "G" by the laboratory.

Detected results flagged "G" by the laboratory indicate that a fuel pattern was present, however, it is in the lighter hydrocarbon end of the detected compounds range.

### TPH EXTRACTABLE (TPHE) ANALYSIS (EPA SW 846 Method 8015)

## I. Holding Times

- A. Due to holding time problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).
  - All TPHE compounds in samples

04530GW003RE

0453SB01RE

The analysis holding time of 40 days was exceeded by one day in the samples listed above.

### II. Surrogate Recovery

A. All criteria were met.

### III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The MS/MSD analysis was not performed due to insufficient sample availability

## IV. Blank Spike or Laboratory Control Sample (LCS)

A. All criteria were met.

#### V. Blank Contamination

A. All criteria were met.

#### VI. Calibrations

A. All criteria were met.

#### VII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

#### VIII. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All TPHE detected results reported below the Tetra Tech EMI required report limit (RL)

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

- B. Due to identification problems, the following results were raised to the Required Limit (RL) and are reported as nondetected (UJj).
  - TPH as motor oil in sample

04530GW003

The result reported was less than 1/2 the RL. It is the opinion of the reviewer that the positive results reported by the laboratory for the compounds listed above are both qualitatively and quantitatively unacceptable.

#### NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic and physical parameters were analyzed for; Hexavalent Chromium and Total Organic Carbon (TOC).

#### I. Holding Times

- A. Due to holding time problems, the following nondetected results are qualified as estimated (UJh).
  - Hexavalent chromium in sample

04530ER01

The analysis holding time of 24 hours was exceeded by 4.25 hours in the sample listed above.

#### II. Calibrations

A. All criteria were met.

#### III. Blank Contamination

A. All criteria were met.

#### IV. Matrix Spike (MS)

A. All criteria were met.

#### V. Matrix Duplicate (DUP)

A. The DUP analysis was not performed for this SDG.

#### VI. Laboratory Control Sample (LCS)

A. All criteria were met.

#### VII. Field Duplicate

A. No field duplicate samples were identified in this SDG.

#### VIII. Other Qualifications

A. The following results are qualified as estimated (Jg).

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All Non-CLP inorganic and physical analysis results above the IDL and below the RL.

Results above the IDL and below the RL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

#### OVERALL ASSESSMENT OF DATA

#### I. Method Compliance and Additional Comments

- A. All analyses were conducted within all specifications of the requested methods with the exceptions listed below.
  - For the volatile analyses, the LCS analysis was not performed for this SDG.
  - For the semivolatile, pesticide, PCB, and TPHE analyses, the MS/MSD analysis was not performed for this SDG due to insufficient sample availability.
  - For the metals analysis, the DUP and ICP serial dilution analyses were not performed for this SDG.
  - For the non-CLP inorganic and physical analysis, the DUP analysis was not performed for this SDG.

#### II. Usability

#### **Volatile Organic Analysis**

- A. No results for volatile analysis were rejected in this SDG.
- B. Due to common laboratory contamination problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to common laboratory contamination problems, Methylene chloride was qualified nondetect in one sample.
  - All detected results reported below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for volatile analysis in this SDG.

#### Semivolatile Organic Analysis

- A. No results for semivolatile analysis were rejected in this SDG.
- B. Due to problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:
  - All detected results reported below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for semivolatile analysis in this SDG.

#### Pesticide Analysis

A. No results for pesticide analysis were rejected in this SDG.

- Due to problems in the pesticide analysis, several samples were qualified as estimated. The B. findings were as follows:
  - All detected results reported below the RL were qualified as estimated.

No samples were reextracted or reanalyzed for pesticide analysis in this SDG.

#### **PCB** Analysis

- No results for PCB analysis were rejected in this SDG. Α.
- Due to instrument calibration problems in the pesticide analysis, several samples were qualified В. as estimated. The findings were as follows:
  - Due continuing calibration %D problems, Aroclor-1016, Aroclor-1221, and Aroclor-1232 nondetected results were qualified as estimated in three samples.
  - All detected results reported below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for PCB analysis in this SDG.

#### Metals Analysis

- No results for metals analysis were rejected in this SDG. A.
- Due to instrument calibration and calibration and method blank contamination problems in the B. metals analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to CRI standard recovery problems, Thallium detected results were qualified as estimated in one sample.
  - Due to calibration and method blank contamination problems, Aluminum and Zinc were qualified nondetect in three samples, Thallium, Barium, and Calcium were qualified nondetect in one sample, and Beryllium, Lead, and Molybdenum were qualified nondetect in two samples.
  - All detected results reported above the IDL but below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for metals analysis in this SDG.

#### **TPH Gasoline Analysis**

- Α. No results for TPH gasoline analysis were rejected in this SDG.
- B. Due to problems in the TPH gasoline analysis, several samples were qualified as estimated. The findings were as follows:
  - All detected results reported below the Tetra Tech EMI required report limit (RL) were qualified as estimated.
  - All detected results flagged with a "G" by the laboratory were qualified as estimated,
- No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG. C.

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#### **TPH Extractable Analysis**

- A. No results for TPHE analysis were rejected in this SDG.
- B. Due to holding time and compound identification problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to holding time exceedance problems, all TPHE results were qualified as estimated in two samples.
  - Due to compound identification problems, TPH as motor oil results were qualified as nondetected in one sample.
  - All detected results reported below the Tetra Tech EMI required report limit (RL) were qualified as estimated.
- C. Samples 04530ER01, 04530GW003, and 04530SB01 were reanalyzed for silica gel cleanup. For samples 04530ER01, 04530GW003, and 04530SB01, all TPHE results should not be considered usable. The TPHE results for samples 04530ER01RE, 04530GW003RE, and 04530SB01RE should be considered the most usable.

# Non-CLP Inorganic and Physical Analysis

- A. No results for non-CLP inorganic and physical analysis were rejected in this SDG.
- B. Due to holding time problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:
  - Due holding time exceedance problems, Hexavalent chromium nondetected results were qualified as estimated in one sample.
  - All detected results reported above the IDL but below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.
- III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the cursory data validation all other results are considered valid and usable for all purposes.

#### DATA VALIDATION REPORT

		Teelneview
Site:	NWS Concord	
Contract Task Order (CTO) No.:	G9016-0450302020709	N. Bopisova, It FMI
Laboratory:	Curtis & Tompkins, Ltd.	02/04/194

Data Reviewer: Richard Amano, Stacey Swenson, Erlinda Rauto, Pei Geng, Felomina

Tanguilig, Ming Hwang, and Steve Ziliak.

Firm/Proj. No: Laboratory Data Consultants, Inc./11460B

Review Date: January 27, 2004

Sample Delivery Group (SDG) No.: 169134

Sample Nos.: 04530GW001 04530GW001RE 04530GW002DRE 04530GW001MS

04530GW002\* 04530GW002RE\* 04530TB02 04530GW001MSD

04530GW002D

\* Full Validation Sample

Matrix: Water

Collection Date(s): November 26, 2003

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (March 1997), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (September 1998) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data yalidation criteria outlined in the above referenced documents were assessed, and any qualify actions made to the data were in accordance with those documents.

Certified by Richard Amang

Principal Chemist

#### DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (\*).

#### **CLP Organic Parameters**

# Holding times GC/MS instrument performance check

- \* Initial and continuing calibrations
- \* Blanks
- \* Surrogate recovery
- \* Matrix spike/matrix spike duplicate
- \* Laboratory control sample or blank spike
- \* Field duplicates
- \* Internal standard performance
  Target compound identification
  Tentatively identified compounds
  Compound quantitation
  Reported detection limits
  System performance
  \* Overall assessment of data for the SDG

- **CLP Inorganic Parameters** 
  - \* Holding times
  - \* Initial and continuing calibrations
  - \* Blanks
  - \* Matrix spike
  - \* Laboratory control sample or blank spike
  - \* Field duplicates
  - \* Matrix duplicates
    ICP interference check sample
  - \* ICP serial dilution
    Sample result verification
    Analyte quantitation
    Reported detection limits
  - Overall assessment of data for the SDG

#### Non-CLP Organic and Inorganic Parameters

- \* Method compliance
- \* Holding times
- \* Initial and continuing calibrations
- \* Blanks
- \* Matrix spike/matrix spike duplicate
- Laboratory control sample or blank spike
- \* Field duplicates
- Matrix duplicates
- Surrogate recovery
   Analyte quantitation
   Reported detection limits
- \* Overall assessment of data for the SDG

#### DATA VALIDATION QUALIFIERS AND CODES

#### **Data Validation Qualifiers**

- UJ Estimated nondetected result
- J Estimated detected result
- R Rejected result
- NJ Tentatively Identified Compound (TIC)

#### **Data Validation Qualifier Codes**

- a Surrogate recovery exceedance
- **b** Laboratory method blank and common blank contamination
- c Calibration exceedance
- d Duplicate precision exceedance
- e Matrix spike/laboratory control sample (LCS) recovery exceedance
- f Field blank contamination
- g Quantification below reporting limit
- h Holding time exceedance
- i Internal standard exceedance
- j Other qualifications

TABLE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	pg. 6	<b>√</b>	N/A	N/A	pg. 6	pg. 6	1	✓	pg. 7	pg. 7
SVOA	1	✓	N/A	N/A	✓	1	1	1	1	pg. 9-10
Pesticide	1	1	N/A	N/A	✓	1	1	N/A	✓	pg. 11-12
PCB	1	1	N/A	N/A	<b>√</b>	1	pg. 13	N/A	1	pg. 14
Metals	✓	N/A	pg. 16	N/A	✓	pg. 15	pg. 15	1	pg. 16-17	pg. 17
TPHG	1	✓	✓	N/A	✓	1	1	N/A	1	pg. 18
ТРНЕ	1	✓	N/A	N/A	✓	1	1	N/A	1	pg. 20-21
CRVI	1	N/A	✓	N/A	1	1	1	N/A	✓	pg. 24
TOC	1	N/A	✓	N/A	✓	1	1	N/A	✓	pg. 24
pН	1	N/A	N/A	✓	✓	1	1	N/A	✓	pg. 24
TSS	1	N/A	N/A	1	<b>√</b>	1	1	N/A	pg. 23	pg. 24

#### Notes:

√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.

N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 04530GW002\* and 04530GW002RE\*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	✓	1	✓	✓	<b>√</b>	<b>√</b>	N/A	N/A
SVOA	1	1	1	<b>/</b>	✓	✓	N/A	N/A
Pesticide	N/A	1	✓	1	N/A	<b>√</b>	N/A	N/A
PCB	N/A	1	✓	1	N/A	<b>√</b>	N/A	N/A
Metals	N/A	1	1	1	N/A	1	1	N/A
TPHG	N/A	✓	✓	pg. 21-22	N/A	<b>√</b>	N/A	N/A
ТРНЕ	N/A	✓	✓	pg. 21	N/A	✓	N/A	N/A
CRVI	N/A	1	✓	1	N/A	<b>√</b>	N/A	N/A
TOC	N/A	1	✓	✓	N/A	✓	N/A	N/A
рН	N/A	✓	✓	✓	N/A	✓	N/A	N/A
TSS	N/A	✓	✓	<b>√</b>	N/A	1	N/A	N/A

#### Notes:

 $\sqrt{}$  indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines. N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

#### DATA ASSESSMENT

# **VOLATILE ORGANIC ANALYSIS (EPA SW 846 Method 8260B)**

#### I. Holding Times

- A. All samples were received in good condition with the following exceptions. The following detected and nondetected results are qualified as estimated (Jj/UJj).
  - All volatile compounds in samples

04530GW002\*

04530GW002D

Headspace was apparent in the sample containers for these samples. There should be no headspace in the sample containers.

#### II. Surrogate Recovery

A. All criteria were met.

### III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The MS/MSD analysis was not performed for this SDG due to insufficient sample availability.

# IV. Blank Spike or Laboratory Control Sample (LCS)

- A. Due to the lack of LCS analysis, the following detected and nondetected results are estimated (Je/UJe).
  - All volatile compounds in sample 04530GW001 04530GW002D 04530TB02 04530GW002\*

The LCS analysis was not performed in the same batch as the samples listed above.

#### V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

• Acetone in samples 04530GW001 04530GW002\*

• Methylene chloride in sample 04530GW002\*

Acetone, Methylene chloride, and 2-Butanone are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

#### VI. Calibrations

A. All criteria were met.

#### VII. Internal Standards

A. All criteria were met.

#### VIII. Field Duplicate

- A. The following RPDs were obtained for the field duplicate samples 04530GW002\* / 04530GW002D:
  - 200% for Acetone
  - 200% for Methylene chloride

For water samples, the field RPD guideline is  $\pm$  25%. The data are not qualified on the basis of field duplicate results.

#### IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All VOA detected results reported below the RL.

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530GW002\*

#### X. GC/MS Instrument Performance Checks

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS instrument performance check. The samples were analyzed within 12 hours of the associated instrument performance check.

#### XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

# XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

# XIII. Tentatively Identified Compounds (TICs)

A. No TIC results were reported in this SDG.

#### XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

# SEMIVOLATILE ORGANIC ANALYSIS (EPA SW 846 Method 8270C)

I.	Holding Times
A.	All criteria were met.
П.	Surrogate Recovery
A.	All criteria were met.
III.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	The MS/MSD analysis was not performed for this SDG due to insufficient sample availability.
IV.	Blank Spike or Laboratory Control Sample (LCS)
A.	All criteria were met.
V.	Blank Contamination
A.	All criteria were met.
VI.	Calibrations
A.	All criteria were met.
VII.	Internal Standards
A.	All criteria were met.
VIII.	Field Duplicate
A.	All criteria were met.

The following results are qualified as estimated (Jg).

All SVOA detected results reported below the RL

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IX.

A.

Other Qualifications

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530GW002\*

#### X. GC/MS Instrument Performance Checks

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS instrument performance checks. The samples were analyzed within 12 hours of the associated instrument performance check.

#### XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated.

Target compound identification was considered to be correct.

#### XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### XIII. Tentatively Identified Compounds (TICs)

A. No TIC results were reported in this SDG.

#### XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

#### PESTICIDE ANALYSIS (EPA SW 846 Method 8081A)

# I. **Holding Times** A. All criteria were met. II. **Surrogate Recovery** A. All criteria were met. Ш. Matrix Spike/Matrix Spike Duplicate (MS/MSD) A. The MS/MSD analysis was not performed for this SDG due to insufficient sample availability. IV. Blank Spike or Laboratory Control Sample (LCS) A. All criteria were met. V. **Blank Contamination** A. All criteria were met. VI. **Calibrations** A. All criteria were met. VII. **Field Duplicate** A. All criteria were met. VIII. **Compound Identification** A. All criteria were met. IX. **Other Qualifications** The following results are qualified as estimated (Jg). A. All pesticide detected results reported below the RL.

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Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530GW002\*

### X. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### XI. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

# POLYCHLORINATED BIPHENYL (PCB) ANALYSIS (EPA SW 846 Method 8082)

I.	Holding Times
A.	All criteria were met.
II.	Surrogate Recovery
A.	All criteria were met.
III.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	The MS/MSD analysis was not performed for this SDG due to insufficient sample availability.
IV.	Blank Spike or Laboratory Control Sample (LCS)
A.	All criteria were met.
V.	Blank Contamination
A.	All criteria were met.
VI.	Calibrations
A.	Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJc)
	• Aroclor-1016, Aroclor-1221, and Aroclor-1232 in samples 04530GW001 04530GW002*
	The following continuing calibrations had percent differences (%D) of >15%.
	Calibration Date 12/3/03Column ID RTX-CLP1Compound Aroclor-1016%D 19

# VII. Field Duplicate

A. All criteria were met.

# VIII. Compound Identification

A. All criteria were met.

#### IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All PCB detected results reported below the RL

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530GW002\*

### X. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### XI. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

#### METALS ANALYSIS (EPA SW 846 Methods 6010B/6020/7000)

#### I. Holding Times

A. All criteria were met.

#### II. Calibrations

A. Due to calibration problems, the following detected results are qualified as estimated (Jc).

Arsenic in samples

04530GW001

04530GW002\*

04530GW002D

The CRI (12/10/03 09:00) percent recovery for Arsenic was 53%, less than the control limits of 75-125%.

B. Due to calibration problems, the following detected results are estimated (Jc).

• Potassium in samples

04530GW001

04530GW002\*

04530GW002D

• Selenium in sample

04530GW001

• Thallium in sample

04530GW002\*

The CRI (12/10/03 11:48) percent recovery for Potassium was 133% and the CRI (12/10/03 09:00) percent recoveries for Selenium and Thallium were 136% and 143%, respectively, above the control limits of 75-125%.

#### III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Selenium in sample

04530GW001

• Antimony in sample

04530GW002\*

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte Blank ID
Antimony ICB/CCB
Selenium ICB/CCB

Concentration 45.5 ug/L

3.5 ug/L

Detected results less than 5x the maximum blank contamination were qualified.

#### IV. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

- A. Due to accuracy problems in the MS/MSD analysis, the following detected results are qualified as estimated (Je).
  - Potassium in samples 04530GW001 04530GW002\* 04530GW002D

The recoveries that did not meet the QC limits are listed below.

Sample ID	<b>Analyte</b>	<u>MS %R</u>	MSD %R	<b>QC</b> Limits	RPD	QC Limits
04530GW001	Potassium	64	33	75-125%		

Spike recoveries between 30-74% indicate that detects may be biased low and false nondetects may have been reported.

- B. Due to accuracy problems in the MS/MSD analysis, the following detected results are qualified as estimated (Je).
  - Arsenic, Magnesium, and Manganese in samples 04530GW001 04530GW002D 04530GW002\*

The recoveries that did not meet the QC limits are listed below.

Sample ID	<b>Analyte</b>	<u>MS %R</u>	MSD %R	<b>QC</b> Limits	RPD	QC Limits
04530GW001	Arsenic	132	_	75-125%	-	-
04530GW001	Magnesium	127	-	75-125%	_	_
04530GW001	Manganese	130	-	75-125%	_	_

Spike recoveries above 125% indicate that detected results may be biased high.

#### V. Matrix Duplicate (DUP)

A. The DUP analysis was not performed for this SDG.

#### VI. Laboratory Control Sample (LCS)

A. All criteria were met.

#### VII. ICP Serial Dilution

A. All criteria were met.

#### VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 04530GW002\* / 04530GW002D:

- 65% for Aluminum
- 200% for Antimony
- 63% for Iron
- 200% for Thallium
- 47% for Zinc

For water samples, the field RPD guideline is  $\pm$  25%. The data are not qualified on the basis of field duplicate results.

#### IX. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All metals results above the IDL but below the RL

Results above the IDL but below the RL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530GW002\*

#### X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. Graphite Furnace Atomic Absorption analysis was not utilized in this SDG.

#### XII. ICP Interference Check Sample

A. The ICSA analysis was not performed for this SDG.

# TPH GASOLINE (TPHG) ANALYSIS (EPA SW 846 Method 8015)

# A. All criteria were met. II. **Surrogate Recovery** A. All criteria were met. III. Matrix Spike/Matrix Spike Duplicate (MS/MSD) A. All criteria were met. IV. Blank Spike or Laboratory Control Sample (LCS) A. All criteria were met. V. **Blank Contamination** A. All criteria were met. VI. **Calibrations** A. All criteria were met. VII. **Field Duplicate** A. All criteria were met. VIII. Other Qualifications The following results are qualified as estimated (Jg). A. All TPHG detected results reported below the Tetra Tech EMI required report limit (RL)

Detected results reported below the RL are considered to be qualitatively acceptable, but

quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

I.

**Holding Times** 

#### Full Validation Criteria for Sample 04530GW002\*

### IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

#### XI. Compound Identification

A. Target compound identification was considered to be correct for sample 04530GW002\*.

# TPH EXTRACTABLE (TPHE) ANALYSIS (EPA SW 846 Method 8015)

II.	Surrogate Recovery
A.	All criteria were met.
III.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	The MS/MSD analysis was not performed due to insufficient sample availability
IV.	Blank Spike or Laboratory Control Sample (LCS)
A.	All criteria were met.
v.	Blank Contamination
A.	All criteria were met.
VI.	Calibrations
A.	All criteria were met.
VП.	Field Duplicate
A.	All criteria were met.
VIII.	Other Qualifications
A.	The following results are qualified as estimated (Jg).
	• All TPHE detected results reported below the Tetra Tech EMI required report limit (RL)
	Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.
В	The following results are qualified as estimated (H)

I.

A.

**Holding Times** 

All criteria were met.

I to His

• All TPHE detected results flagged with a "H" by the laboratory.

Detected results flagged H by the laboratory indicate that a fuel pattern was present. however it is in the heavier hydrocarbon end of the detected compounds range.

B &

The following results are qualified as estimated (L).

• All TPHE detected results flagged with a "L" by the laboratory.

Detected results flagged H by the laboratory indicate that a fuel pattern was present. however it is in the <u>lighter hyd</u>rocarbon end of the detected compounds range.

 $\triangle$ . The following results are qualified as estimated (Z).

• All TPHE detected results flagged with a "Z" by the laboratory.

Detected results flagged Z by the laboratory indicate that the fuel pattern does not resemble TPH.

#### Full Validation Criteria for Samples 04530GW002\* and 04530GW002RE\*

#### IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The RL was reported at 300 ug/L for TPH as motor oil. The RL should be  $\leq$  the Tetra Tech EMI RL which is 100 ug/L for TPH as motor oil.

The reported sample results reflect any dilutions, weights, volumes, and percent moisture.

#### X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

#### XI. Compound Identification

- A. Target compound identification was considered to be correct for samples 04530GW002\* and 04530GW002RE\*.
- B. Due to identification problems, the following results were raised to the Required Limit (RL) and are reported as nondetected (UJj).
  - TPH as motor oil in sample

04530GW001RE

The result reported was less than 1/2 the RL. It is the opinion of the reviewer that the positive results reported by the laboratory for the compounds listed above are both qualitatively and quantitatively unacceptable.

#### NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic and physical parameters were analyzed for; Hexavalent Chromium, Total Organic Carbon (TOC), pH, and Total Suspended Solids (TSS).

#### I. Holding Times

A. All criteria were met.

#### II. Calibrations

A. All criteria were met.

#### III. Blank Contamination

A. All criteria were met.

#### IV. Matrix Spike (MS)

A. All criteria were met.

#### V. Matrix Duplicate (DUP)

A. All criteria were met.

#### VI. Laboratory Control Sample (LCS)

A. All criteria were met.

#### VII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 04530GW002\* / 04530GW002D:

• 38% for TSS

For water samples, the field RPD guideline is  $\pm$  25%. The data are not qualified on the basis of field duplicate results.

#### VIII. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All Non-CLP inorganic and physical analysis results above the IDL and below the RL.

Results above the IDL and below the RL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

#### Full Validation Criteria for Sample 04530GW002\*

#### VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

#### OVERALL ASSESSMENT OF DATA

#### I. Method Compliance and Additional Comments

- A. All analyses were conducted within all specifications of the requested methods with the exceptions listed below.
  - For the volatile, semivolatile, pesticide PCB, and TPHE analyses, the MS/MSD analysis was not performed for this SDG due to insufficient sample availability.
  - For the volatile analyses, the LCS analysis was not performed for this SDG.
  - For the metals analysis, the DUP and ICSA analyses were not performed for this SDG.
  - For the TPHE analysis, the reported detection limits were not consistent with Tetra Tech EMI's required report limits. The RL was reported at 300 ug/L for TPH as motor oil. The RL should be ≤ the Tetra Tech EMI RL which is 100 ug/L for TPH as motor oil.

#### II. Usability

#### **Volatile Organic Analysis**

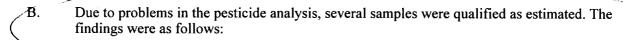
- A. No results for volatile analysis were rejected in this SDG.
- B. Due to sample condition, LCS, and common laboratory contamination problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to the sample condition, all volatile results were qualified as estimated in two samples.
  - Due to the lack of LCS analysis, all volatile results were qualified as estimated in four samples.
  - Due to common laboratory contamination problems, Acetone was qualified nondetect in two samples and Methylene chloride was qualified nondetect in one sample.
- All detected results reported below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for volatile analysis in this SDG.

#### Semivolatile Organic Analysis

- A. No results for semivolatile analysis were rejected in this SDG.
- B. Due to problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:
  - All detected results reported below the RL were qualified as estimated.
- No samples were reextracted or reanalyzed for semivolatile analysis in this SDG.

#### Pesticide Analysis

A. No results for pesticide analysis were rejected in this SDG.



All detected results reported below the RL were qualified as estimated.



No samples were reextracted or reanalyzed for pesticide analysis in this SDG.

#### **PCB Analysis**

- A. No results for PCB analysis were rejected in this SDG.
- B. Due to instrument calibration problems in the pesticide analysis, several samples were qualified as estimated. The findings were as follows:
  - Due continuing calibration %D problems, Aroclor-1016, Aroclor-1221, and Aroclor-1232 nondetected results were qualified as estimated in three samples.
  - All detected results reported below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for PCB analysis in this SDG.

#### **Metals Analysis**

- A. No results for metals analysis were rejected in this SDG.
- B. Due to instrument calibration, calibration and method blank contamination, and MS/MSD problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to CRI standard recovery problems, Potassium and Arsenic detected results were qualified as estimated in three samples and Selenium and Thallium detected results were qualified as estimated in one sample.
  - Due to calibration and method blank contamination problems, Antimony and Selenium were qualified nondetect in one sample.
  - Due to MS/MSD recovery problems, Arsenic, Magnesium, Manganese, and Potassium detected results were qualified as estimated in three samples.
  - All detected results reported above the IDL but below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for metals analysis in this SDG.

#### **TPH Gasoline Analysis**

A. No results for TPH gasoline analysis were rejected in this SDG.

B. Due to problems in the TPH gasoline analysis, several samples were qualified as estimated. The findings were as follows:

All detected results reported below the Tetra Tech EMI required report limit (RL) were qualified as estimated.





No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG.

#### **TPH Extractable Analysis**

- A. No results for TPHE analysis were rejected in this SDG.
- B. Due to compound identification problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to compound identification problems, TPH as motor oil results were qualified as nondetected in one sample.
  - All detected results reported below the Tetra Tech EMI required report limit (RL) were qualified as estimated.
  - All detected results flagged with a "H", "Z", or "L" by the laboratory were qualified as estimated.
- C. Samples 04530GW001, 04530GW002\*, and 04530GW002D were reanalyzed for silica gel cleanup. For samples 04530GW001, 04530GW002\*, and 04530GW002D, all TPHE results should not be considered usable. The TPHE results for samples 04530GW001RE, 04530GW002RE\*, and 04530GW002DRE should be considered the most usable.

#### **Non-CLP Inorganic and Physical Analysis**

- A. No results for non-CLP inorganic and physical analysis were rejected in this SDG.
- B. Due to problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:
  - All detected results reported above the IDL but below the RL were qualified as estimated.
- C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.
- III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the cursory and full data validation all other results are considered valid and usable for all purposes.

#### DATA VALIDATION REPORT

Site: **NWS Concord** 

Contract Task Order (CTO) No.: G9016-0450302020709

Laboratory: Columbia Analytical Services, Inc.

N Borisona THEMI 02/07/04 Data Reviewer: Richard Amano, Stacey Swenson, and Pei Geng

Firm/Proj. No: Laboratory Data Consultants, Inc./11460D

Review Date: January 27, 2004

Sample Delivery Group (SDG) No.: DB901

Sample Nos.: 04530SB003\* 04530GW003

\* Full Validation Sample

Matrix: Soil and Water

Collection Date(s): November 24 through November 25, 2003

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review" (March 2002). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses" (March 1997), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (September 1998) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

Certified by Richard Amano

Principal Chemist

#### DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (\*).

#### **CLP Organic Parameters**

# CLP Inorganic Parameters

- \* Holding times
  - GC/MS instrument performance check
- \* Initial and continuing calibrations
- \* Blanks
- Surrogate recovery
- \* Matrix spike/matrix spike duplicate
- \* Laboratory control sample or blank spike
- Field duplicates
- \* Internal standard performance
  Target compound identification
  Tentatively identified compounds
  Compound quantitation
  Reported detection limits

System performance

Overall assessment of data for the SDG

- \* Holding times
- \* Initial and continuing calibrations
- \* Blanks
- \* Matrix spike
- \* Laboratory control sample or blank spike
- \* Field duplicates
- Matrix duplicates

ICP interference check sample

GFAA quality control

k ICP serial dilution

Sample result verification

Analyte quantitation

Reported detection limits

Overall assessment of data for the SDG

#### Non-CLP Organic and Inorganic Parameters

- Method compliance
- \* Holding times
- \* Initial and continuing calibrations
- \* Blanks
- \* Matrix spike/matrix spike duplicate
- Laboratory control sample or blank spike
- \* Field duplicates
- \* Matrix duplicates
- \* Surrogate recovery

Analyte quantitation

Reported detection limits

\* Overall assessment of data for the SDG

#### **DATA VALIDATION QUALIFIERS AND CODES**

#### **Data Validation Qualifiers**

- UJ Estimated nondetected result
- J Estimated detected result
- R Rejected result
- NJ Tentatively Identified Compound (TIC)

#### **Data Validation Qualifier Codes**

- a Surrogate recovery exceedance
- **b** Laboratory method blank and common blank contamination
- c Calibration exceedance
- **d** Duplicate precision exceedance
- e Matrix spike/laboratory control sample (LCS) recovery exceedance
- f Field blank contamination
- g Quantification below reporting limit
- h Holding time exceedance
- i Internal standard exceedance
- j Other qualifications

TABLE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
Dioxins/Dibenzofurans	<b>√</b>	N/A	N/A	N/A	✓	pg. 6	1	pg. 6-7	N/A	pg. 7

### Notes:

√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.

N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

# TABLE 2 FULL DATA VALIDATION SUMMARY Sample(s) 04530SB003\*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
Dioxins/Dibenzofurans	✓	✓	✓	✓	N/A	✓	N/A	N/A

### Notes:

 $\sqrt{}$  indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.

N/A indicates the parameter is not applicable to an analysis.

If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.

The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

## **DATA ASSESSMENT**

## DIOXINS AND DIBENZOFURANS ANALYSIS

I.	Holding Times
A.	All criteria were met.
П.	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
A.	The MS/MSD analysis was not performed for this SDG.
Ш.	Blank Spike or Laboratory Control Sample (LCS)
A.	All criteria were met.
IV.	Blank Contamination
A.	Due to method blank contamination, the following results are considered nondetected (UJb).
	• OCDD in sample 04530GW003
	The following compound was detected in the associated method blank at the concentration noted below.
	Blank ID Compound Concentration, pg/L EB16060-MB OCDD Concentration, pg/L
	Detected results less than 5x the blank contamination were qualified.
V.	Calibrations
A.	All criteria were met.
VI.	Internal Standards
A.	Due to internal standard problems, the following detected and nondetected results are qualified as estimated (Ji/UJi).
	• OCDD and OCDF in samples 04530SB003* 04530GW003

The internal standard percent recoveries in the samples listed above were within the 40-135% QC Limits with the exceptions listed below.

<u>Sample</u>	Internal Standard	<u>%R</u>	QC Limits
04530SB003*	<sup>13</sup> C-OCDD	26.00	40-135%
04530GW003	<sup>13</sup> C-OCDD	34.99	40-135%

Internal standard percent recoveries of less than 40% may indicate a loss of instrument sensitivity.

## VII. Field Duplicate

A. No field duplicates were identified in this SDG.

## VIII. Other Qualifications

- A. The following results are qualified as estimated (Jg).
  - All Dioxin/Dibenzofuran detected results reported below Tetra Tech EMI's required reporting limits (RL).

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

## Full Validation Criteria for Sample 04530SB003\*

## IX. GC/MS Instrument Performance Check

- A. Instrument performance chromatographic percent resolutions (%R) between  $C^{13}$ -2,3,7,8-TCDD and  $C^{13}$ -1,2,3,4-TCDD were  $\leq$ 25%. All ion abundance ratio criteria were within the QC limits. The GC column performance was checked for resolution daily. The valley resolution between 2,3,4,7,8-HxCDD and 1,2,3,6,7,8-HxCDD isomers was  $\leq$ 50%.
- B. For Penta-, Hexa-, and Hepta- isomers, an inverse ion abundance ratio and CLP limits were used by the laboratory. Although these limits are slightly different than those of SW 846, the data was evaluated as technically acceptable.

## X. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

## XI. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and the reported sample results reflect any dilutions, weights, volumes, and percent moisture.

## XII. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

#### OVERALL ASSESSMENT OF DATA

#### I. **Method Compliance and Additional Comments**

- A. All analyses were conducted within all specifications of the requested methods with the exception listed below.
  - The MS/MSD analysis was not performed for this SDG.



### **Dioxin/Dibenzofuran Analysis**

- No results for dioxin/dibenzofuran analysis were rejected in this SDG. A.
- Due to method blank contamination and internal standard problems in the dioxin/dibenzofuran B. analysis, several samples were qualified as estimated. The findings were as follows:
  - Due to method blank contamination problems, OCDD was qualified nondetect in one sample.
  - Due to internal standard recovery problems, OCDD and OCDF results were qualified as estimated in two samples.
- C. For sample 04530SB003\* the original results for 2,3,7,8-TCDF from DB-5 are not considered usable. The usable result is the confirmation analysis from DB-225.
- III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the cursory and full data validation all other results are considered valid and usable for all purposes.

Pa Tt Etist SOW detected remits reported for Tt Etist SOW detected remits reported felow me se should be qualified on eximited (Jg). Tristead, detected remits bushes the strange qualified as estimated.

The lab was entroised by LDC ho address his issue.

DB901.REP 1/28/2004

APPENDIX H
PREVIOUS SAMPLING INVESTIGATION RESULTS (EXCERPTED FROM THE
DRAFT FINAL REMEDIAL INVESTIGATION REPORT FOR SITE 30)

#### INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	2/1/	SSCS 2000 - 0.50 <sup>a</sup>	2/1	SSNS /2000 - 0.50 <sup>a</sup>		2/1	SSSS /2000 - 0.50 <sup>a</sup>		2/2	SB05 /2000 - 0.50		2/2/	SB106 /2000 - 0.50		2/2/	SPWSS 2000 - 0.50		SB0 2/6/1 0.00 -	996		SB 2/6/ 2.00		
		Det.		Det.			Det.			Det.			Det.			Det.			Det.			Det.	
Analyte	Result	Lim. Qual		Lim.	Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result		Qual.	Result		Qual.	Result	Lim.	Qual.	Result	Lim.	
ALUMINUM	12900	3.98	14300	3.99		13800	3.79		10500	4.64		12400	3.86		7430	4.19		6970	5		19000	6.6	
ANTIMONY	3.02	0.01	J 0.91	0.01	J	0.98	0.01	J	1.12	0.01	J	0.37	0.01	J	6.72	0.01	J	5.6	0.45	J	0.59	0.59	UJ
ARSENIC	32.6	0.1	14.3	0.1		9.8	0.09		10.4	0.1		7.7	0.1		57	0.1		58.4	0.39		7.6	0.51	
BARIUM	414	0.4	146	0.4		120	0.38		268	0.46		175	0.39		646	0.42		4660	0.08		87.3	0.11	
BERYLLIUM	0.28	0.01	0.32	0.01		0.31	0.01		0.48	0.01		0.4	0.01		0.21	0.01		0.03	0.03	U	0.6	0.04	
CADMIUM	2.38	0.02	J 0.46	0.02	J	0.93	0.02	J	1.55	0.02	J	0.31	0.02	J	7.8	0.02	J	0.56	0.56	U	0.07	0.07	U
CALCIUM	33800	1.99	51300	1.99		31600	1.89		2850	2.32		2780	1.93		10200	2.09		27900	4	J	4000	5.2	J
CHROMIUM	50.8	0.03	38.1	0.03	J	35.1	0.03	J	32.5	0.04	J	29.4	0.03	J	73.4	0.04	J	136	0.11		46.3	0.15	
COBALT	11.7	0.004	6.59	0.004		7.35	0.004		14.8	0.005		8.88	0.004		15.8	0.005		23.4	0.11		9.1	0.15	
COPPER	130	0.02	J 49	0.02	J	72.5	0.02	J	49	0.03	J	21.7	0.02	J	311	0.03	J	608	0.14	J	33.6	0.18	J
IRON	94700	1.99	27300	1.99		32900	1.89		20900	2.32		15600	1.93		290000	10.5		328000	31		14800	4	
LEAD	547	7.96	87.2	7.97		189	7.57		162	9.28		268	7.73		2300	41.9		2560	0.22		22.6	0.29	
MAGNESIUM	12500	8.0	15300	8.0		15600	0.76		5970	0.93		5500	0.77		4850	0.84		2490	4.6		8060	6	
MANGANESE	998	0.4	1520	0.4		632	0.38		1940	0.46		422	0.39		1660	2.09		1200	0.03		328	0.04	
MERCURY	0.21	0.01	0.22	0.01		0.29	0.01		0.26	0.01		0.05	0.01	UJ	0.18	0.01		0.42	0.07		0.09	0.09	U
MOLYBDENUM	5.22	0.01	3.09	0.01	J	4.15	0.01	J	0.47	0.01	J	0.31	0.01	J	5.13	0.01	J	9.7	0.17		0.24	0.22	U
NICKEL	59.5	0.02	J 40	0.02	J	39	0.02	J	43.2	0.03	J	36.2	0.02	J	59.7	0.03	J	58.6	0.2		41.3	0.26	
POTASSIUM	3960	199	4020	199		4460	189		3830	232		2680	193		1360	209		2600	6.1	J	6480	8	J
SELENIUM	1.6	0.2	2	0.2		2	0.2		0.6	0.3	UJ	0.3	0.2	UJ	1.2	0.3		0.65	0.65	U	0.84	0.84	U
SILVER	0.422	0.01	0.26	0.01		0.333	0.009		0.563	0.01		0.131	0.01		1.08	0.01		5.4	0.14		0.36	0.18	U
SODIUM	46500	11.9	51000	12		63700	11.4		4170	13.9		10500	11.6		2520	12.6		1030	23.6	J	11500	30.8	J
THALLIUM	0.14	0.01	J 0.14	0.01	J	0.13	0.01	J	0.17	0.01	J	0.11	0.01	J	0.14	0.01	J	5.3	5.3	U	0.7	0.7	U
VANADIUM	60.2	0.4	57.4	0.4		55.7	0.38		35.7	0.46		40.1	0.39		40.5	2.09		14.2	0.11		49.7	0.15	
ZINC	1980	0.4	J 89	0.4	J	226	0.38	J	284	0.46	J	71.2	0.39	J	2270	2.09	J	4090	2.8		85.3	0.37	

#### Notes:

U = not detected at detection limit indicated J = estimated value

#### INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	SB( 2/6/1 0.00 -	996		SB0 2/6/1 2.00 -	996		SB0 2/6/1: 0.00 -	996		SB( 2/6/1 2.00 -	996		SB 3/18/ 0.00			3/18	004 /1997 - 1.50		SB( 3/18/ 0.00 -	1997	
		Det.			Det.			Det.			Det.			Det.			Det.			Det.	
Analyte	Result		Qual.	Result		Qual.	Result	Lim.	Qual.	Result		Qual.			Qual.	Result	Lim. C	Qual.	Result	Lim.	
ALUMINUM	6300	4.6		9880	4.6		4570	4.7		11600	4.5		4750	4.3		7480	4.1		4200	3.7	-
ANTIMONY	8.0	0.41	J	0.41	0.41	UJ	84.2	0.42	J	0.4	0.4	UJ	18.1	0.4	J	0.37		UR	0.81	0.34	UJ
ARSENIC	5.8	0.36		4.6	0.36		142	0.37		3.1	0.35		61.2	0.5	J	2	0.45	J	8.6	0.41	J
BARIUM	223	0.08		117	0.08		765	0.08		278	0.07		927	1.96		387	1.9		123	1.7	-
BERYLLIUM	0.16	0.03		0.31	0.03		0.03	0.03	UJ	0.33	0.02		0.16	0.16	U	0.55	0.15	J	0.25	0.14	_
CADMIUM	0.05	0.05		0.05	0.05		5.5	0.05		0.05	0.05	U	2.8	0.078	J	0.07		UJ	0.07	0.07	UJ
CALCIUM	2430	3.6		977	3.6	J	3160	3.7	J	669	3.5	J	17800	7.15		1090	6.8	J	2530	6.2	
CHROMIUM	16.5	0.1		21.2	0.1		125	0.1		23	0.1		119	0.86		17.4	0.82		13.6	0.74	
COBALT	12.7	0.1		6.6	0.1		22	0.1		9.5	0.1		37.5	1.9		5.8	1.8	J	9.5	1.7	J
COPPER	25.7	0.13	-	13.7	0.13		6670	0.13	J	12.7	0.12	J	378	0.4	J	12.3		UJ	28.4	0.34	
IRON	11700	2.8		12600	2.8		142000	14.4		12500	2.7		272000	237	J	88800	225.4	J	14400	20.3	J
LEAD	34.7	0.21		8	0.2		7680	1.1		6.5	0.2		5030	22.2	J	6.4	0.42	J	201	0.38	J
MAGNESIUM	3070	4.2		5140	4.1		1680	4.3		5370	4.1		2700	6.1		4020	5.8		1640	5.2	
MANGANESE	1480	0.03		156	0.03		987	0.03		414	0.02		1420	1.15		312	0.55		428	0.5	
MERCURY	0.06	0.06	U	0.06	0.06	U	26.4	0.7		0.06	0.06	U	2.1	0.065		0.08	0.08	U	0.06	0.05	U
MOLYBDENUM	0.54	0.15	U	0.15	0.15	C	18.1	0.16	J	0.15	0.15	C	6	0.8		0.74	0.74	U	0.67	0.67	U
NICKEL	27.8	0.18		24.8	0.18		262	0.18		32.9	0.17		96.3	2.1		27.3	1.9		20.8	1.8	
POTASSIUM	3290	5.6	J	3340	5.5	J	1130	5.7	٦	3280	5.4	۲	869	25.4	J	2950	24.1		1180	21.8	1
SELENIUM	0.59	0.59	U	0.59	0.59	U	0.6	0.6	UJ	0.57	0.57	U	9	0.9	J	0.84	0.84	UJ	0.95	0.76	J
SILVER	0.13	0.13		0.13	0.13	U	2.3	0.13		0.12	0.12	U	1.9	1.9	U	1.8		U	1.6	1.6	
SODIUM	2240	21.5	J	5470	21.4	J	630	22	J	7140	20.9	J	1720	6.4		5370	6.1		1660	5.5	
THALLIUM	1.4	0.49	U	0.48	0.48	U	2.5	2.5	UJ	0.47	0.47	U	0.32	0.32	U	0.28		U	0.28	0.28	
VANADIUM	26.3	0.1		28.6	0.1		31.3	0.1		30.1	0.1		16.9	0.6		22	0.55		27.3	0.5	
ZINC	89.5	0.26		34.3	0.25		3960	1.3		32	0.25		2100	4.4	J	18.8	2.1	J	126	1.9	J

#### Notes:

U = not detected at c J = estimated value

#### INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	SB0 3/18/1 1.00 -	997	3/18	8006 /1997 - 0.50	3/18	006 /1997 - 1.50		SB0 3/18/1 0.00 -	997		SB0 3/18/ 1.00 -	1997		SB0 3/18/1 0.00 -	1997	SB( 3/18/ 1.00 -	1997	
		Det.		Det.		Det.			Det.			Det.			Det.		Det.	
Analyte	Result	Lim. Qual.	Result	Lim. Qua	l. Result	Lim. Q	ual.	Result	Lim.	Qual.	Result		Qual.	Result	Lim. Qual.	Result	Lim. Qu	ıal.
ALUMINUM	7840	4.1	5400	3.5	12000	3.5		4040	3.5		9350	3.8		7860	3.7	11000	3.7	
ANTIMONY	0.37	0.37 UR	0.71	0.32 UJ	0.35		UJ	0.95	0.32	UJ	0.39	0.35	UJ	1	0.34 UJ	0.49	0.34 U	IJ
ARSENIC	2.9	0.44 J	6.2	0.38 J	3.5	0.4	J	6.1	0.4	J	3	0.42	J	10.2	0.4 J	2.6	0.41 J	J
BARIUM	244	1.9	115	1.6	363	1.6		124	1.6		201	1.7		236	1.7	302	1.7	
BERYLLIUM	0.43	0.15 J	0.35	0.13 J	0.57	0.13	J	0.3	0.13	J	0.5	0.14	J	0.47	0.13 J	0.58	0.14 J	J
CADMIUM	0.07	0.07 UJ	0.06	0.06 UJ	0.06	0.06	UJ	0.06	0.06	UJ	0.07	0.07	UJ	0.07	0.07 UJ	0.07	0.07 U	JJ
CALCIUM	1030	6.7 J	2550	5.8	2200	5.9		2450	5.9		2380	6.4		4710	6.1	1930	6.2	
CHROMIUM	18.3	0.81	15.6	0.7	26.4	0.71		20.5	0.71		21.2	0.77		30.4	0.74	22.8	0.75	
COBALT	8.5	1.8 J	8.3	1.6 J	10.8	1.6		20.5	1.6		10.9	1.7	J	9.8	1.7 J	8.3	1.7 J	J
COPPER	12.1	0.37 UJ	20.1	0.32 J	12.9	0.32	UJ	30.5	0.32	J	11.8	0.35	UJ	39.1	0.34 J	14.4	0.34 J	J
IRON	9850	22.2 J	7870	19.3 J	14000	19.5	J	12800	19.6	J	10600	21.1	J	14700	20.3 J	12100	20.7 J	J
LEAD	9.7	0.42 J	66.9	0.4 J	8.6	0.36	J	184	0.37	J	7.4	0.4	J	129	0.4 J	8.2	0.4 J	J
MAGNESIUM	3480	5.8	1840	5	3880	5		1640	5		3620	5.4		4000	5.2	3810	5.3	
MANGANESE	368	0.54	415	0.5	519	0.5		367	0.47		482	0.51		425	0.49	388	0.5	
MERCURY	0.07	0.07 U	0.09	0.05 U	0.05	0.05	U	0.19	0.05	С	0.1	0.06	C	0.09	0.05 U	0.07	0.06 L	J
MOLYBDENUM	0.73	0.73 U	0.64	0.64 U	0.64	0.64	U	0.65	0.65	U	0.7	0.7	U	0.84	0.67 J	0.68	0.68 L	J
NICKEL	30.2	1.9	23.2	1.6	47.5	1.7		72.2	1.7		36.6	1.8		49.8	1.7	37.9	1.8	
POTASSIUM	2080	23.8	581	20.7 J	649	20.8	J	605	21	J	510	22.6	J	918	21.7 J	494	22.2 J	J
SELENIUM	0.83	0.83 UJ	0.74	0.72 J	0.87	0.73	J	0.96	0.73	J	0.79	0.79	UJ	0.76	0.76 UJ	0.77	0.77 U	JJ
SILVER	1.7	1.7 U	1.5	1.5 U	1.5	1.5	U	1.5	1.5	U	1.6	1.6	С	1.6	1.6 U	1.6	1.6 L	J
SODIUM	5220	6	578	5.2 J	3730	5.2		402	5.3	J	3040	5.7		274	5.5 J	2770	5.6	
THALLIUM	0.28	0.28 U	0.26	0.26 U	0.28	0.28	U	0.24	0.24	U	0.28	0.28	U	0.26	0.26 U	0.28	0.28 L	J
VANADIUM	30.7	0.54	30.2	0.5	39.8	0.5		27.8	0.47		37.4	0.51		35.2	0.49	30.9	0.5	
ZINC	23.5	2.1 J	42.1	1.8 J	27.6	1.8	J	120	1.8	J	23	2	J	98.9	1.9 J	26	1.9 J	J

#### Notes:

U = not detected at c J = estimated value

## INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	SB0 3/18/ 0.00 -	1997 0.50		SB0 3/18/1 1.00 -	997 1.50		SB0 3/18/1 0.00 -	997		SB0 3/18/1 1.00 -	1997		SB0 3/18/ 0.00 -	1997 0.50		SB0 3/18/ 1.00 -	1997		SB0 3/7/1 0.00 -	997 0.50	
		Det.			Det.			Det.			Det.			Det.			Det.			Det.	
Analyte	Result	Lim. Q	ual.	Result	Lim. Qu	al.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim. Q	lual.	Result	Lim.	Qual.
ALUMINUM	6360	5.5		6750	3.5		4920	3.6		8970	4		8090	4.1		9200	3.7		5750	3.2	
ANTIMONY	6	0.5	J	0.32	0.32 U	R	32.2	0.33	J	0.47	0.36	UJ	0.66	0.38	UJ	0.34		UR	5	0.29	J
ARSENIC	37.8		J	4.9	0.38		34	0.4	J	2.6	0.43	J	14.7	0.45	J	2.4	0.41	J	6.6	0.35	J
BARIUM	391	2.5		149	1.6		302	1.6		257	1.8		210	1.9		90.2	1.7		127	1.5	
BERYLLIUM	0.22	0.2	J	0.41	0.13		0.2	0.13	J	0.41	0.15	J	0.33	0.15	J	0.45	0.14	J	0.31	0.12	J
CADMIUM	3.3		J	0.06	0.06 U	J	13.4	0.07	J	0.07	0.07	UJ	0.08	0.08	UJ	0.07		UJ	0.16	0.06	UJ
CALCIUM	8490	9.2		1540	5.8		3910	5.9		944	6.6	J	3850	6.9		1690	6.2		1750	5.3	
CHROMIUM	43.1	1.1		16.6	0.7		100	0.72		19.9	8.0		29.7	0.83		20.3	0.75		17.7	0.64	
COBALT	19	2.5		10.1	1.6		19.1	1.6		10.5	1.8	J	10.2	1.9	J	7.5	1.7	J	13.9	1.4	
COPPER	327	0.5	J	13.9	0.32		12500	32.5	J	19	0.36	J	50.2	0.38	J	12.4	0.34	U	71.7	0.29	J
IRON	134000	305	J	10600	19.3		112000	197	J	10600	21.9	J	13200	22.9	J	10000	20.7	J	8500	17.6	J
LEAD	1560	2.9	J	7.8	0.36		1870	3.7	J	7.6	0.41	J	318	0.85	J	6.1	0.4	J	749	1.7	J
MAGNESIUM	5030	7.9		2970	5		1990	5.1		3320	5.6		3730	5.9		3730	5.3		1650	4.5	
MANGANESE	747	0.74		156	0.47		857	0.48		501	0.53		544	0.56		364	0.5		654	0.43	
MERCURY	2.2	0.1		0.08	0.06 L	1	0.69	0.06		0.05	0.05	U	0.11	0.06	U	0.08	0.06	U	0.12	0.06	U
MOLYBDENUM	2.1	1		0.64	0.64 L		2.5	0.65		0.72	0.72	U	0.75	0.75	U	0.68	0.68	U	0.58	0.58	U
NICKEL	68.6	2.6		24.7	1.6		73.5	1.7		28.8	1.9		40.3	1.9		28.3	1.8		21.9	1.5	
POTASSIUM	1650	33	J	2450	20.6		1140	21.1		2100	23.5		1770	24.5		2750	22.1		833	18.8	J
SELENIUM	5	1.1	J	0.72	0.72 U	J	4	0.74	J	0.82	0.82	UJ	1	0.85	J	0.77	0.77	UJ	1.1	0.66	J
SILVER	2.4	2.4	U	1.5	1.5 L	1	1.5	1.5	С	1.7	1.7	U	1.8	1.8	U	1.6	1.6	U	1.4	1.4	U
SODIUM	10700	8.2		5730	5.2		550	5.3	J	4510	5.9		3490	6.2		6140	5.6		651	4.7	J
THALLIUM	0.37	0.37	U	0.3	0.3 L		0.27	0.27	U	0.29	0.29	U	0.29	0.29	U	0.29	0.29	U	0.24	0.24	U
VANADIUM	45.1	0.74		39.6	0.47		31.2	0.48		35.9	0.53		34.6	0.55		25.4	0.5		31.1	0.43	
ZINC	5410	14.1	J	21.5	1.8		4960	36.4	J	24	2.1	J	154	2.1	J	19.5	1.9	J	196	1.6	J

#### Notes:

U = not detected at c

J = estimated value

D1-4 DS.0309.15133

#### INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	SB0 <sup>-</sup> 3/18/1 1.00 -	997 1.50		SB( 10/13 0.00 ·	/1997 · 0.50		SB0 10/13, 0.00 -	/1997 · 0.50		SB0 10/13/ 0.00 -	1997		SB0 10/16/ 0.00 -	1997 0.25	10/13	017 8/1997 - 0.50		SB0 10/13/ 0.00 -	1997	
Analyte	Result	Det. Lim. (	Qual.	Result	Det. Lim. Q	Dual	Result	Det. Lim. Qu	ıal.	Result D	et. Lim. c	Dual	Result	Det. Lim. Qual.	Result I	Det. Lim.	Qual	Result D	et. Lim.	Qual
ALUMINUM	12900	4		10700	3.9	.1	9350	3.9 J	1	7930	6.9	J	4880	21.7 J	3	3	J	3080	5	J
ANTIMONY	0.37	0.37	UR	2.5	0.51	.l	6.4	0.51 J	ĺ	26.3	0.92	J	2.9	2.9 UJ	0.39	0.39	.J	5.8	0.67	<u> </u>
ARSENIC	3.4	0.44	J	19.7	0.44		61.4	0.44	1	57.7	0.79	Ŭ	9.5	2.5 J	0.34	0.34		106	0.57	
BARIUM	404	1.8		680	0.73	J	1140	0.72 J	J	683	1.3	J	123	4.1 J	5.6	5.6	J	194	0.94	J
BERYLLIUM	0.52	0.15	J	0.02	0.018	U	0.02	0.018 U	J	0.03	0.032	U	0.1	0.099 U	0.01	0.014	U	0.02	0.023	U
CADMIUM	0.07	0.07	UJ	0.1	0.071	UJ	0.68	0.07 U	IJ	0.13	0.13	UJ	0.4	0.4 UJ	0.05	0.054	UJ	0.09	0.092	UJ
CALCIUM	1660	6.7		7370	15.8	J	12500	15.7 J	J	16300	28.2	J	67100	88.4 J	10900	12.1	J	7460	20.5	J
CHROMIUM	27.6	0.8		45.4	0.16	J	78	0.16 J	J	2990	0.29	J	0.89	0.89 J	174	0.12	J	47.9	0.21	J
COBALT	10.7	1.8	J	11.1	0.23	UJ	21.7	0.23		14.4	0.41	J	1.3	1.3 UJ	36.7	0.18		16.6	0.3	
COPPER	14.3	0.37	J	1030	0.19	J	270	0.19 J	J	726	0.35	J	1.1	1.1 J	515	0.15	J	1670	0.25	J
IRON	14400	22.2	J	62800	11.3	J	234000	112 J	J	126000	20.2	J	63.2	63.2 J	378000	86.7	J	212000	14.6	J
LEAD	9.7	0.41	J	597	0.3	J	3280	0.3 J	J	1020	0.54	J	1.7	1.7 J	2030	0.23	J	1270	0.39	J
MAGNESIUM	4300	5.7		8880	15.7		6430	15.6		7770	28.2		88.2	88.2	3730	12.1		5980	20.4	
MANGANESE	444	0.54		748	0.12	J	1200	1.2 J	J	833	0.22	J	0.69	0.69 J	1590	0.95	J	994	0.16	J
MERCURY	0.06	0.06	U	0.39	0.18		0.17	0.16 U	IJ	0.16	0.31	О	0.5	0.99 U	0.15	0.14	UJ	0.16	0.22	UJ
MOLYBDENUM	0.73	0.73	U	301	0.21		5	0.21		7.7	0.38		1.2	1.2 J	6.9	0.16		6.6	0.28	
NICKEL	42.6	1.9		48.7	0.16	J	67.2	0.16 J	J	79.1	0.29	J	0.89	0.89 J	258	0.12	J	81.5	0.21	J
POTASSIUM	946	23.7	J	3650	34.2		3220	34		3410	61.2		192	192	1510	26.3		1710	44.4	
SELENIUM	0.98	0.83	J	2.4	0.71		7.8	0.7		6.8	1.3		4	4 U	12	0.54		7.6	0.92	
SILVER	1.7	1.7	U	2.5	0.19		2.6	0.19		2.8	0.35	J	1.1	1.1 U	11.4	0.15	UJ	1.2	0.25	
SODIUM	5520	6		20600	851		16300	84.5		29500	152		477	477	16600	654		22000	110	
THALLIUM	0.28	0.28	U	1.1		U	1.1	1.1 U	J	1.9	1.9	U	6	6 U	0.82	0.82	U	1.4	1.4	
VANADIUM	37	0.54		41.8	0.21		34.8	0.21	_	39.9	0.38		1.2	1.2 J	28.1	0.16	ابا	24.5	0.28	
ZINC	28.1	2.1	J	912	5.7	J	1660	5.6 J	J	1540	10.1	J	3.2	3.2 J	2060	4.4	J	1130	7.4	J

#### Notes:

U = not detected at c J = estimated value

#### INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	SB0 10/13/ 0.00 -	/1997 · 0.50		SB 10/13 0.00	- 0.50					SB1 2/11/ 0.00 -	1998 0.50		SB <sup>-</sup> 2/11/ 0.00 -	1998		2/1	B103 1/1998 0 - 0.50		SB <sup>-</sup> 2/11/ 0.00 -	1998 · 0.50	
		Det.			Det.			Det.			Det.		_							Det.	
Analyte	Result		Qual.	Result	Lim. (	Qual.	Result		Qual.	Result		Qual.		et. Lim. Qua	ıl. F		Det. Lim.	Qual.	Result	Lim.	
ALUMINUM	3430	3.6		9650	3.3	J	8450	19.8		12600	6.6		11200	16.9		8500	21.9		7630	13.5	
ANTIMONY	3.8	0.47		2.7	0.44	J	5.6	5.6	UJ	1.9	1.9		4.8	4.8 U		6.2		UJ	3.8	3.8	
ARSENIC	52.7	0.41		22.9	0.38		6.2	5.8	J	8.9	1.9		5.8	5 J		21.8			3.9	3.9	
BARIUM	184	0.67	J	336	0.62	J	111	6.8	J	56.8	2.2	J	132	5.8 J		198	7.5	J	114	4.6	J
BERYLLIUM	0.02	0.016	U	0.02	0.015	U	0.16	0.16	U	0.17	0.053	UJ	0.14	0.14 L		0.18	0.18	U	0.11	0.11	U
CADMIUM	0.07	0.065	UJ	0.06	0.06	UJ	0.48	0.48	U	0.16	0.16	U	0.41	0.41 L		0.53	0.53	UJ	0.33	0.33	U
CALCIUM	3670	14.5		4120	13.5	J	40100	170		10800	56.1		53300	145		26800			37800	115	
CHROMIUM	85	0.15		74.6	0.14	J	27.6	1.8		30.9	0.59		34.9	1.5		33.5			23	1.2	
COBALT	27.8	0.21		12.2	0.2	UJ	7.8	2.7	J	4.8	0.91	J	7.7	2.3 J		12.7	3	J	6.5	1.9	J
COPPER	432	0.18	J	1980	0.17	J	54.9	3.7		39	1.2		52.1	3.2		182	4.1		50.5	2.5	
IRON	348000	104	J	108000	9.6	٦	27700	41.3		17300	13.7		30300	35.3		67400	45.6		18500	28.1	
LEAD	1640	0.28	J	1180	0.26	٦	97.2	2.9	J	67.9	0.96	J	83.3	2.5 J		506	3.2	J	68.2	2	J
MAGNESIUM	5320	14.5		6170	13.4		12500	204		6470	67.6		12800	175		13300	226		9580	139	
MANGANESE	1490	1.1	J	591	0.11	J	1360	0.48		330	0.16		1900	0.41		936	0.53		1340	0.33	
MERCURY	0.08	0.17	U	0.64	0.15		0.74	0.37	U	0.28	0.14	U	0.75	0.38 L		0.84	0.42	U	0.54	0.27	U
MOLYBDENUM	6	0.2		2.9	0.18		8	2.4	J	2.6	0.8	J	3.7	2.1 J		6.2	2.7	J	1.9	1.6	J
NICKEL	91.7	0.15	J	126	0.14	٦	36.9	3.4	J	35.8	1.1		37.4	2.9 J		55.8	3.7	J	27.5	2.3	J
POTASSIUM	1840	31.5		2370	29.2		3570	354	J	3390	117		3820	302 J		4420	391	J	3230	240	J
SELENIUM	11.5	0.65		4.2	0.6		7.6	7.6	U	2.5	2.5	U	6.9	6.5 J		8.4	8.4	UJ	5.2	5.2	U
SILVER	0.91	0.18	UJ	0.9		UJ	3.4	3.4	U	1.1	1.1	U	2.9	2.9 L		3.7	3.7	U	2.3	2.3	U
SODIUM	20100	784		22000	726		49500	978		14800	323		34200	835		46600			22400	664	
THALLIUM	1.7	0.98	UJ	0.91	0.91	U	10.2	10.2	UJ	3.4	3.4	UJ	8.7	8.7 U		11.2	11.2	UJ	6.9	6.9	UJ
VANADIUM	28.1	0.2		39.2	0.18		56.5	2.6	J	43.1	0.85		53.3	2.2 J		53.1	2.8	J	36.6	1.8	J
ZINC	737	5.2	J	1800	4.8	J	96	5		65.7	1.7		87.9	4.3		502	5.5		84.7	3.4	

#### Notes:

U = not detected at c J = estimated value

#### INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	2/11	105 /1998 - 0.50		2/11	106 /1998 - 0.50		6/8/	6200 /1998 - 0.50		SS: 6/8/1 0.00 -	998		6/8/	202 1998 - 0.50	6/8/	203 1998 - 0.50	6	SS204 /8/1998 00 - 0.50	
		Det.			Det.		_			_			_			Det.			
Analyte	Result	Lim.	Qual.	Result		Qual.	Result [		Qual.	Result D				et. Lim. Qua		Lim. Qu		Det. Lim	
ALUMINUM	11900	3.2		17100	5.1		23300	2.2	J	9720	2.8		10200	2.7 J	12500	2.3 J	13300		
ANTIMONY	0.92	0.92	UJ	1.6	1.4		1.4	1.4	R	1.8	1.8	R	1.7	1.7 R	1.5	1.5 F			
ARSENIC	5	0.95	UJ	24.8	1.5		18.8	0.99	J	13.6	1.3	J	11.5	1.2 J	11.9	1.1 J			
BARIUM	205	1.1		202	1.7		133	0.51	J	120	0.67	J	164	0.62 J	120	0.54 J	131	0.67	′ J
BERYLLIUM	0.026	0.026	U	0.39	0.041	J	0.49	0.027	J	0.04	0.04	J	0.03	0.03 J	0.03	0.03 J			↓ J
CADMIUM	0.079	0.079	U	0.46	0.12	J	0.94	0.08	J	0.79	0.11	J	0.66	0.098 J	0.83	0.086 J	3.4		
CALCIUM	8470	27.7		3750	43.5		15300	16.1	J	40500	21.2	J	51600	19.8 J	44500	17.3 J			
CHROMIUM	14.8	0.29		148	0.46		53.3	0.24	J	33.2	0.32	J	30.9	0.29 J	39.7	0.26 J	38.2		
COBALT	12.8	0.45	J	7.9	0.7	J	8.7	0.37	J	6.6	0.49	J	5.6	0.46 J	6.9	0.4 J	10.9	0.49	) J
COPPER	37.1	0.61		111	0.95		91	0.32	J	59.1	0.42	J	47	0.39 J	54.1	0.34 J	199	0.42	2 J
IRON	23300	6.8		26000	10.6		29500	4.9	J	28800	6.4	J	27200	6 J	27900	5.2 J	41200	6.4	ł J
LEAD	24.9	0.47	J	257	0.75	J	163	0.48	J	87.1	0.63	J	72.2	0.59 J	78.8	0.51 J	165	0.63	} J
MAGNESIUM	9980	33.4		7090	52.5		12300	15.5	J	12300	20.4	J	12200	19 J	10500	16.6 J	13000	20.3	} J
MANGANESE	327	0.079		274	0.12		471	0.053	J	1410	0.07	J	1570	0.066 J	1060	0.057 J	830	0.07	′ J
MERCURY	0.12	0.06	С	0.19	0.1	IJ	0.24	0.24	U	0.37	0.37	U	0.31	0.31 U	0.26	0.26 L	1.5	0.32	2
MOLYBDENUM	0.4	0.4	C	0.8	0.62	J	2.2	0.4	J	4	0.53	J	2.3	0.49 J	4.1	0.43 J	4.1	0.53	3 J
NICKEL	23.2	0.55		52.4	0.87		68.8	0.35	J	38.6	0.46	J	33.4	0.43 J	41.4	0.37 J	49.5	0.46	) J
POTASSIUM	5020	57.9		5390	90.9		7080	38.7	J	3750	51	J	3570	47.5 J	3590	41.5 J	4990	50.9	J
SELENIUM	1.2	1.2	U	1.9	1.9	U	1.7	1.2		2.4	1.6		1.7	1.5	1.4	1.3 J	1.3	1.6	j J
SILVER	0.55	0.55	U	1.4	0.87	UJ	0.35	0.35	U	0.46	0.46	J	0.45	0.43 J	0.37	0.37 L	1.5	0.46	j J
SODIUM	1940	160		7260	251		30900	1390		38000	1830		34900	1710	18400	149	52800		
THALLIUM	2.1	1.7	J	2.6	2.6		3.4	1.8	J	3.5	2.4	J	2.6	2.2 J	1.9	1.9 J			
VANADIUM	62.2	0.42		57.9	0.66		80.5	0.4	J	48.5	0.53	J	46.1	0.49 J	62.9	0.43 J	53.4		
ZINC	74.3	0.82		596	1.3		358	0.58	J	94	0.82	J	107	0.74 J	205	0.66 J	609	0.79	J

#### Notes:

U = not detected at c J = estimated value

DS.0309.15133

#### INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	SS2 6/8/1 0.00 -	998 0.50		6/8/	206 1998 - 0.50		6/8/	- 0.50		6/8/	208 1998 - 0.50		6/8/	209 1998 - 0.50	6/8/	210 1998 - 0.50	6/8/	211 1998 - 0.50
_		Det.			Det.			Det.			Det.					Det.		Det.
Analyte	Result	Lim.		Result	Lim.	Qual.	Result	Lim.	Qual.	Result		Qual.		et. Lim. Qual.	Result	Lim. Qual.	Result	Lim. Qual.
ALUMINUM	1890	1.8	J	5410	0.53	J	5200	1	J	6440	0.53	J	6870	2 J	8880	0.46 J	7750	0.46 J
ANTIMONY	2.1	1.1	J	1.2	0.33	J	0.64	0.64	R	0.34	0.34	R	1.4	1.3 J	0.29	0.29 R	0.29	0.29 R
ARSENIC	26.8	0.82	J	7.7	0.24	J	3.2	0.46	J	3.9	0.24	J	10.9	0.93 J	4.7	0.21 J	3.1	0.21 J
BARIUM	67.4	0.42	J	215	0.12	J	72.4	0.24	J	90.2	0.13	J	266	0.48 J	110	0.11 J	125	0.11 J
BERYLLIUM	0.02	0.02	J	0.02	0.0066	UJ	0.01	0.01	٦	0.16	0.0066	UJ	0.03	0.03 J	0.11	0.0057 UJ	0.17	0.0057 UJ
CADMIUM	2.4	0.067	J	1.6	0.02	J	0.26	0.038	UJ	0.27	0.02	UJ	1.1	0.075 J	0.38	0.017 J	0.25	0.017 UJ
CALCIUM	10800	13.4	J	4270	4	J	19800	7.6	٦	2540	4	J	99500	15.2 J	7250	3.4 J	2690	3.4 J
CHROMIUM	15.2	0.2	J	28.9	0.059	J	12.9	0.11	۲	12.4	0.059	٦	20.6	0.23 J	23.3	0.051 J	16.4	0.051 J
COBALT	5.6	0.31	J	9.6	0.092	J	4.3	0.18	J	6	0.092	J	6.7	0.35 J	6.1	0.08 J	5.4	0.08 J
COPPER	166	0.27	J	565	0.079	J	17.4	0.15	J	12.2	0.079	J	73	0.3 J	13.3	0.068 J	9.2	0.068 J
IRON	63200	4.1	J	48600	1.2	J	11300	2.3	J	12300	1.2	J	24700	4.6 J	10700	1 J	8580	1 J
LEAD	378	0.4	J	486	0.12	J	34.6	0.23	J	50.2	0.12	J	85	0.45 J	29.8	0.1 J	44.5	0.1 J
MAGNESIUM	3810	12.9	J	2360	3.8	J	5090	7.3	J	3440	3.8	J	14300	14.5 J	2670	3.3 J	2650	3.3 J
MANGANESE	311	0.044	J	321	0.013	J	712	0.025	J	240	0.013	J	2480	0.05 J	285	0.011 J	233	0.011 J
MERCURY	0.17	0.17	U	0.05	0.05	C	0.11	0.11	C	0.05	0.05	С	0.2	0.2 U	0.05	0.05 U	0.04	0.04 U
MOLYBDENUM	3	0.33	J	0.67	0.098	J	0.42	0.19	J	0.1	0.1	J	4.5	0.38 J	0.09	0.09 J	0.09	0.09 J
NICKEL	25.9	0.29	J	229	0.085	J	16.2	0.16	J	15.5	0.086	J	31.2	0.33 J	23.9	0.074 J	20.4	0.074 J
POTASSIUM	997	32.3	J	1190	9.5	J	1580	18.2	J	1670	9.6	J	3260	36.4 J	1160	8.3 J	537	8.2 J
SELENIUM	0.69	0.69	UJ	0.2	0.2	U	0.47	0.56	J	0.2	0.2	U	2.4	1.1	0.21	0.26 J	0.18	0.18 U
SILVER	0.62	0.29	J	6.7	0.085		0.17	0.16	UJ	0.09	0.09	U	0.58	0.33 J	0.09	0.074 UJ	0.1	0.074 UJ
SODIUM	11400	116		1640	34.1		4640	65.4		1380	34.4		39500	1310	133	29.7 J	159	29.6 J
THALLIUM	2.5	1.5	J	1.6	0.44	J	1.7	0.84	J	0.96	0.44	J	3.5	1.7 J	1.2	0.38 J	0.94	0.38 J
VANADIUM	20.3	0.33	J	16.8	0.098	J	22.8	0.19	J	24.5	0.099	J	37.2	0.38 J	25.2	0.085 J	19.6	0.085 J
ZINC	4980	5.3	J	983	1.5	J	58.8	0.28	J	61.6	0.15	J	175	0.61 J	70.4	0.13 J	46.5	0.12 J

#### Notes:

U = not detected at c J = estimated value

## INORGANIC CHEMICALS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location Sample Date Sample Depth (ft.)	6/8/	212 1998 - 0.50		6/8	3213 /1998 - 0.50		6/8	S214 8/1998 0 - 0.50	
A It . t -	Result	Det.	Qual.	December	Det.	Qual.	D It	Det. Lim.	01
Analyte				Result			Result		Qual.
ALUMINUM	7920	0.43	J	8520	0.44	J	7080	0.41	J
ANTIMONY	0.6	0.27	J	0.28	0.28	R	0.44	0.26	J
ARSENIC	3.1	0.2	J	7.4	0.2	J	8.1	0.19	J
BARIUM	91.2	0.1	J	118	0.1	J	88.2	0.096	J
BERYLLIUM	0.01	0.01	J	0.14	0.0054	UJ	0.01	0.0051	UJ
CADMIUM	0.36	0.016	J	0.69	0.016	J	0.38	0.015	J
CALCIUM	3140	3.2	J	3100	3.3	J	2990	3.1	J
CHROMIUM	31.2	0.048	J	24.1	0.049	J	24	0.046	J
COBALT	8.5	0.075	J	6.1	0.076	J	7.3	0.071	J
COPPER	19.6	0.064	J	57.1	0.065	J	17.5	0.061	J
IRON	14600	0.98	J	11900	0.98	J	11600	0.92	J
LEAD	56.3	0.096	J	110	0.097	J	195	0.091	J
MAGNESIUM	4890	3.1	J	2510	3.1	J	4360	2.9	J
MANGANESE	383	0.011	J	251	0.011	J	311	0.01	J
MERCURY	0.05	0.05	U	0.25	0.045		0.08	0.055	UJ
MOLYBDENUM	0.08	0.08	J	0.08	0.08	J	0.1	0.076	J
NICKEL	39	0.07	J	48	0.07	J	37.9	0.066	J
POTASSIUM	608	7.8	J	1180	7.8	J	993	7.4	J
SELENIUM	0.17	0.17	U	0.17	0.17	U	0.17	0.23	J
SILVER	0.09	0.07	UJ	0.15	0.07	UJ	0.08	0.066	UJ
SODIUM	64	27.9	UJ	187	28.1	J	80.2	26.4	UJ
THALLIUM	1.2	0.36	J	0.81	0.36	J	0.83	0.34	J
VANADIUM	29.5	0.08	J	21	0.081	J	25.9	0.076	J
ZINC	104	0.12	J	337	1.2	J	79	0.11	J

#### Notes:

U = not detected at c

J = estimated value

D1-9 DS.0309.15133

## SEMIVOLATILE ORGANIC COMPOUNDS AND TOTAL PETROLEUM HYDROCARBONS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

	ı						ı		-												<del></del> 1																
Sample Location	SB001		SB001			SB001			SB001			SB001			SB001			SB001			SB003 SB004			2004	SB009				SB010			SB011			۰	B012	
Sample Date	_	/1996		_	1996		_	3/1997		3/18/1997				B/1997		_	8/1997			7/1997																	
Sample Depth (ft.)		- 0.50		_, .,	- 0.50			- 0.50		0.00 - 0				) - 0.50			0 - 0.50			0 - 0.50																	
Sample Depth (it.)	0.00	Det.		0.00	Det.		0.00	Det.			Det.		0.00	Det.		0.0	Det.		0.0	Det.	-																
Analyte	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim. Qu	al. Res			Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result		Qual.																
LOW MOLECULAR WEIGHT POLYCY	CLIC ARON	MATIC H	YDRO	CARBONS ([	LMW P	AH] U	G/KG)																														
2-METHYLNAPHTHALENE	460.00	460.00	U	430.00	430.00	Ū	450.00	450.00 L	58	30.00 58	80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U																
ACENAPHTHENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L	58	30.00 58	80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U																
ACENAPHTHYLENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L	58	30.00 58	80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U																
ANTHRACENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 U	J 58	30.00 58	80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U																
FLUORENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L	58	30.00 58	80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U																
NAPHTHALENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L	58	30.00 58	80.00	U	53.00	370.00	J	430.00	430.00	U	350.00	350.00	U																
PHENANTHRENE	460.00	460.00	U	360.00	430.00	J	450.00	450.00 U	J 58	30.00 58	80.00	U	64.00	370.00	J	430.00	430.00	U	350.00	350.00	U																
SUM LMW PAH	1840.00	5.00		2585.00	4.70		1800.00	4.30	232	20.00	5.50		1461.00	3.60		1720.00	4.10		1400.00	3.20																	
HIGH MOLECULAR WEIGHT POLYC	YCLIC ARON	MATIC H	IYDRO	CARBONS (	[HMW F	PAH] (	JG/KG)																														
BENZO(A)ANTHRACENE	460.00	460.00	U	480.00	430.00	J	450.00	450.00 U			80.00	UJ	370.00	370.00		430.00	430.00	UJ	350.00	350.00																	
BENZO(A)PYRENE	460.00	460.00	UJ	560.00	430.00	J	69.00	450.00 J			80.00	J	370.00	370.00	UJ	430.00	430.00	UJ	350.00	350.00																	
BENZO(B)FLUORANTHENE	460.00	460.00	UJ	1700.00	430.00	J	190.00	450.00 J	17	70.00 58	80.00	J	62.00	370.00	J	430.00	430.00	U	71.00	350.00	J																
BENZO(G,H,I)PERYLENE	460.00	460.00	UJ		430.00	J	110.00	450.00 J			80.00	U	370.00	370.00		430.00	430.00	UJ	350.00	350.00																	
BENZO(K)FLUORANTHENE	460.00	460.00		2200.00 2		UJ	49.00	450.00 J			80.00	U	370.00	370.00	UJ	430.00	4.10		350.00	350.00																	
CHRYSENE	460.00	460.00	U		430.00	J	61.00	450.00 J			80.00	J	45.00	370.00	J	2150.00	4.10		54.00	350.00																	
DIBENZ(A,H)ANTHRACENE	460.00	460.00	UJ		2200.00	UJ	450.00	450.00 U			80.00	U	370.00	370.00		430.00	430.00	U	350.00	350.00																	
FLUORANTHENE	460.00	460.00	U	580.00	430.00		70.00	450.00 J			80.00	J	51.00	370.00	J	210.00	210.00	U	77.00	350.00																	
INDENO(1,2,3-CD)PYRENE	460.00	460.00	UJ		430.00	J	80.00	450.00 J			80.00	U	370.00	370.00	UJ	210.00	210.00	U	350.00	350.00																	
PYRENE	460.00	460.00	U	1500.00	430.00	J	88.00	450.00 J			80.00	J	80.00	370.00	J	210.00	210.00	U	110.00	350.00																	
SUM HMW PAH	1840.00	5.00		22510.00	4.70		2601.00	4.30		30.00	5.50		1639.00	3.60		430.00	430.00	U	1811.00	3.20																	
TOTAL PAHS	3680.00	5.00		25095.00	4.70		4401.00	4.30	620	00.00	5.50		3100.00	3.60	1	1100.00	1100.00	U	3211.00	3.20																	
OTHER SEMIVOLATILE ORGANIC CO				1																																	
2-CHLORONAPHTHALENE	460.00	460.00		430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00		430.00	430.00	U	350.00	350.00																	
1,2,4-TRICHLOROBENZENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00		430.00	430.00	U	350.00	350.00																	
1,2-DICHLOROBENZENE	460.00	460.00	U	430.00	430.00	U	220.00	220.00 L			80.00	U	180.00	180.00	U	430.00	430.00	U	170.00	170.00																	
1,3-DICHLOROBENZENE	460.00	460.00	U	430.00	430.00	U	220.00	220.00 L			80.00	U	180.00	180.00	U	430.00	430.00	U	170.00	170.00																	
1,4-DICHLOROBENZENE	460.00	460.00	U	430.00	430.00	U	220.00	220.00 L			80.00	U	180.00	180.00	U			U	170.00	170.00																	
2,2'-OXYBIS(1-CHLOROPROPANE)	460.00	460.00	U		430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00																	
2,4,5-TRICHLOROPHENOL		1100.00	U		1000.00	U	1100.00				00.00	U	930.00	930.00	U	430.00	430.00	U	890.00	890.00																	
2,4,6-TRICHLOROPHENOL	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00																	
2,4-DICHLOROPHENOL	460.00	460.00	U		430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00																	
2,4-DIMETHYLPHENOL	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	1100.00		U	350.00	350.00																	
2,4-DINITROPHENOL		1100.00	U		1000.00	U	1100.00				00.00	U	930.00	930.00	U	430.00	430.00	U	890.00	890.00																	
2,4-DINITROTOLUENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	430.00	430.00	UJ	350.00	350.00																	
2,6-DINITROTOLUENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	1100.00		U	350.00	350.00																	
2-CHLOROPHENOL	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	1100.00		U	350.00	350.00																	
2-METHYLPHENOL	460.00	460.00	U	430.00	430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00																	
2-NITROANILINE		1100.00	U		1000.00	U	1100.00				00.00	U	930.00	930.00	U	430.00	430.00	U	890.00	890.00																	
2-NITROPHENOL	460.00	460.00	U		430.00	U	450.00	450.00 L			80.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00																	
3,3'-DICHLOROBENZIDINE	460.00	460.00	UJ	2200.00 2		UJ	450.00	450.00 U			00.08	UJ	370.00	370.00	U	430.00	430.00	U	350.00	350.00																	
3-NITROANILINE		1100.00	U		1000.00	U	1100.00				00.00	U	930.00	930.00	U	430.00	430.00	U	890.00	890.00																	
4,6-DINITRO-2-METHYLPHENOL		1100.00	U		1000.00	U	1100.00				00.00	U	930.00	930.00	U			U	890.00	890.00																	
4-BROMOPHENYL-PHENYLETHER	460.00	460.00	U	430.00	430.00	U	450.00	450.00 U	J 58	30.00 5	80.00	U	370.00	370.00	U	1100.00	1100.00	U	350.00	350.00	U																

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## SEMIVOLATILE ORGANIC COMPOUNDS AND TOTAL PETROLEUM HYDROCARBONS TAYLOR BOULEVARD BRIDGE DISPOSAL SITE NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

Sample Location	SE	3001		SE	3003		SI	3004		SE	3009		SE	3010		s	B011		s	B012					
Sample Date	_	/1996			1996			3/1997			/1997		3/18	/1997			8/1997			7/1997					
Sample Depth (ft.)	0.00	- 0.50		0.00	- 0.50		0.00	- 0.50		0.00 - 0.50		0.00 - 0.50		0.00 - 0.50		0.00 - 0.50		0.00 - 0.50		0.00 - 0.50		0.50 0.00 - 0.50		0 - 0.50	
(,		Det.			Det.			Det.			Det.			Det.			Det.		Det.						
Analyte	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.	Result	Lim.	Qual.				
4-CHLORO-3-METHYLPHENOL	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
4-CHLOROANILINE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	С	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
4-CHLOROPHENYL-PHENYLETHER	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	170.00	170.00	UJ	350.00	350.00	U				
4-METHYLPHENOL	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	430.00	430.00	UJ	350.00	350.00	U				
4-NITROANILINE	1100.00	1100.00	U	1000.00	1000.00	U	1100.00	1100.00	U	1500.00	1500.00	U	930.00	930.00	U	430.00	430.00	U	890.00	890.00	U				
4-NITROPHENOL	1100.00	1100.00	U	1000.00	1000.00	U	1100.00	1100.00	U	1500.00	1500.00	U	930.00	930.00	U	430.00	430.00	U	890.00	890.00	U				
BIS(2-CHLOROETHOXY)METHANE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	С	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
BIS(2-CHLOROETHYL)ETHER	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
BIS(2-ETHYLHEXYL)PHTHALATE	460.00	460.00	U	2200.00	2200.00	U	620.00	450.00	UJ	230.00	230.00	UJ	150.00	150.00	U	430.00	430.00	U	140.00	140.00	UJ				
BUTYLBENZYLPHTHALATE	460.00	460.00	U	2200.00	2200.00	U	450.00	450.00	UJ	580.00	580.00	UJ	370.00	370.00	U	430.00	430.00	U	350.00	350.00	UJ				
CARBAZOLE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	UJ	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
DI-N-BUTYLPHTHALATE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
DI-N-OCTYLPHTHALATE	460.00	460.00	UJ	2200.00	2200.00	UJ	450.00	450.00	UJ	580.00	580.00	U	370.00	370.00	UJ	430.00	430.00	U	350.00	350.00	UJ				
DIBENZOFURAN	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
DIETHYLPHTHALATE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
DIMETHYLPHTHALATE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
HEXACHLOROBENZENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	UJ	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
HEXACHLOROBUTADIENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	1100.00	1100.00	U	350.00	350.00	U				
HEXACHLOROCYCLOPENTADIENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	С	580.00	580.00	U	370.00	370.00	U	430.00	430.00	U	350.00	350.00	U				
HEXACHLOROETHANE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	С	580.00	580.00	U	370.00	370.00	U	NA	NA	NA	350.00	350.00	U				
ISOPHORONE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	NA	NA	NA	350.00	350.00	U				
N-NITROSO-DI-N-PROPYLAMINE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	NA	NA	NA	350.00	350.00	U				
N-NITROSODIPHENYLAMINE (1)	460.00	460.00	U	430.00	430.00	U	450.00	450.00	UJ	580.00	580.00	U	370.00	370.00	U	NA	NA	NA	350.00	350.00	U				
NITROBENZENE	460.00	460.00	U	430.00	430.00	U	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	NA	NA	NA	350.00	350.00	U				
PENTACHLOROPHENOL	1100.00	1100.00	U	1000.00	1000.00	U	1100.00	1100.00	UJ	1500.00	1500.00	U	930.00	930.00	U	NA	NA	NA	890.00	890.00	U				
PHENOL	460.00	460.00	U	410.00	430.00	J	450.00	450.00	U	580.00	580.00	U	370.00	370.00	U	NA	NA	NA	350.00	350.00	U				
TOTAL PETROLEUM HYDROCARBO	NS (MG/KG)	)				•		•																	
DIESEL (EXTRACTABLE)	33.00	35.00	J	550.00	260.00		140.00	140.00	U	180.00	180.00	U	56.00	56.00	U	13.00	13.00	U	11.00	11.00	U				
MOTOR OIL (EXTRACTABLE)	240.00	35.00		2900.00	260.00		1300.00	135.00		1700.00	180.00		190.00	56.00		93.00	13.00		140.00	11.00					
GASOLINE (PURGEABLE)	0.70	0.70	UJ	0.65	0.65	UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				

#### Notes:

U = Not detected with detection limit indicated

J = Estimated value

Blank = Value above detection limit

NA = not analyzed

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## REGIONAL WATER QUALITY CONTROL BOARD SURFACE WATER SAMPLE RESULTS FOR TBB DISPOSAL SITE

			TOTAL N	/IETALS					
Analista	Freshwater CCC based on hardness = 2700	Laboratory Reporting Limit	0:4-4	0:4- 0	0:45 0	Cita 4	0:4- 5	0:45.0	0:47
Analyte	mg CaCO3*		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
Silver	44.05	7	ND	ND	ND	ND	ND	ND	ND
Arsenic	150.00	100	ND	ND	ND	ND	ND	ND	ND
Cadmium	185.98	10	ND	ND	ND	ND	ND	ND	ND
Chromium	25820.52	10	ND	ND	ND	ND	ND	ND	71
Copper	312.41	10	ND	ND	ND	ND	ND	ND	ND
Mercury	NA	0.2	ND	ND	ND	ND	ND	ND	ND
Nickel	7625.49	30	ND	ND	ND	ND	ND	ND	ND
Lead	5420.71	75	ND	ND	ND	ND	ND	ND	ND
Selenium	na	100	ND	ND	ND	ND	ND	ND	ND
Zinc	1955.74	20	ND	ND	ND	ND	ND	ND	ND
		DISSO	LVED M	ETALS (	UG/L)				
	Freshwater CCC								
	based on	Laboratory							
	hardness = 2700	Reporting							
Analyte	mg CaCO3*	Limit	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
Silver	1175.83	7	ND	ND	ND	ND	ND	ND	ND
Arsenic	340.00	100	ND	ND	ND	ND	ND	ND	ND
Cadmium	149.92	10	ND	ND	ND	ND	ND	ND	ND
Chromium	8159.28	10	ND	ND	ND	ND	ND	ND	ND
Copper	299.92	10	ND	ND	ND	ND	ND	ND	ND
Mercury	na	0.2	ND	ND	ND	ND	ND	ND	ND
Nickel	7610.24	30	ND	ND	ND	ND	ND	ND	ND
Lead	1684.53	75	ND	ND	ND	ND	ND	ND	ND
Selenium	na	100	ND	ND	ND	ND	ND	ND	ND
Zinc	1912.71	20	ND	20	20	26	21	26	ND

<sup>\*</sup> EPA State of California Water Quality Criteria (California Toxics Rule)
Criterion is hardness dependent. This value corresponds to a total hardness of 2700 mg/L as CaCO3 in as CaCO3 in the water body.

Units are in micrograms per liter CaCO3 - Calcium carbonate

ND - Non detect

## REGIONAL WATER QUALITY CONTROL BOARD SEDIMENT SAMPLE RESULTS FOR TBB DISPOSAL SITE

Analyte	Tidal Area Ambient (mg/kg) <sup>a</sup>	SF Bay Ambient (mg/kg) <sup>b</sup>	ER-L (mg/kg) <sup>c</sup>	ER-M (mg/kg) <sup>c</sup>	Reporting Limit (mg/kg)	Site 1	Site 2	Site 3	Site 4
Silver	NA	0.58	1.00	3.70	0.59	ND	ND	ND	ND
Arsenic	27.00	15.30	8.20	70.00	8.5	ND	ND	ND	120
Cadmium	1.90	0.33	1.20	9.60	0.85	ND	ND	ND	ND
Chromium	82.10	112.00	81.00	370.00	0.85	2.4	1.9	4	15
Copper	81.00	68.10	34.00	270.00	0.85	4.7	3.7	9.4	97
Mercury	0.32	0.43	0.15	0.71	0.019	ND	ND	0.019	0.04
Nickel	120.00	112.00	20.90	51.60	2.5	3.5	2.5	4	18
Lead	95.00	43.20	46.70	218.00	6.4	6.5	ND	17	490
Selenium	NA	0.58	1.00	3.70	8.5	ND	ND	ND	ND
Zinc	264.00	158.00	150.00	410.00	1.7	10	7.7	18	87

### Notes:

ER-L - Effects range-low (Long and others 1995).

ER-M - Effects range-median (Long and others 1995).

mg/kg - Milligrams per kilogram

ND - Nondetect

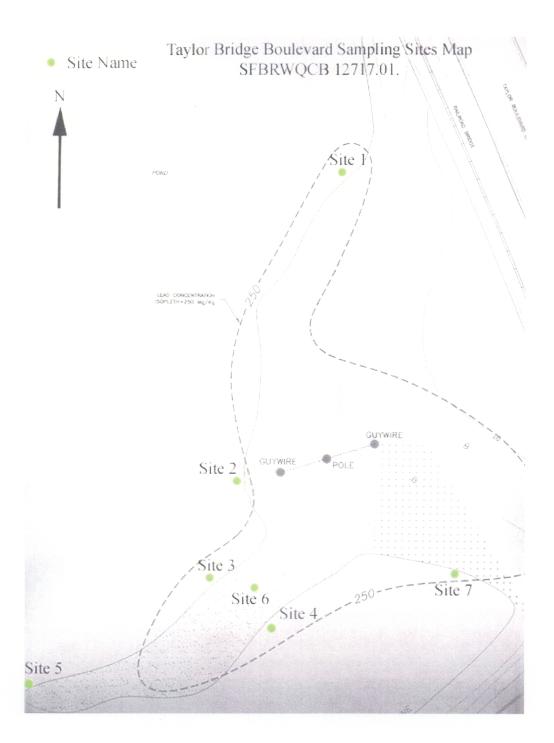
SF- San Francisco.

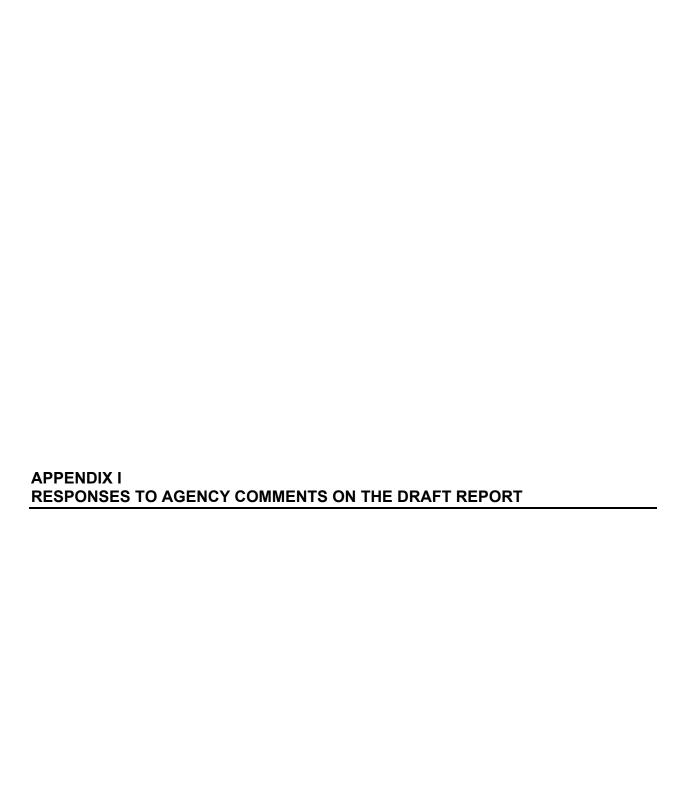
Concentrations in Marine and Estuarine Sediments." Environmental Management.

<sup>&</sup>lt;sup>a</sup> PRC Environmental Management, Inc. 1996. "Technical Memorandum, Ambient Metal Concentrations in the Tidal Area Soils."

<sup>&</sup>lt;sup>b</sup> RWQCB. 1998. "Ambient Concentrations of Toxic Chemicals in San Francisco Bay Sediments." May.

<sup>&</sup>lt;sup>c</sup> Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. "Incidence of Adverse Biological Effects Within Ranges of Chemical





## RESPONSES TO REGULATORY AGENCY COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION ADDENDUM REPORT **TAYLOR BOULEVARD BRIDGE (SITE 30)** NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD, **CONCORD, CALIFORNIA**

This document presents the U.S. Department of the Navy's (Navy) responses to comments from the U.S. Environmental Protection Agency (EPA); the California Regional Water Quality Control Board (RWQCB); and the California Department of Toxic Substances Control (DTSC) on the Draft Remedial Investigation Addendum Report for the Taylor Boulevard Bridge (Site 30), Naval Weapons Station Seal Beach, Detachment Concord, Concord, California, dated April 12, 2004.

The comments addressed below were each received from EPA on May 20, 2004; RWQCB on May 20, 2004; and DTSC on May 24, 2004.

## **RESPONSES TO EPA COMMENTS**

1. **Comment:** Based upon a review of the RI Addendum, U.S. EPA has determined

that the report is generally well prepared, organized and complete. However, U.S. EPA does have a few specific comments, included

below.

Response: Comment acknowledged.

2. **Comment:** U.S. EPA is concerned by the statements made in the last paragraph

> on page ES-2 and Recommendations on page 24. On the one hand the Navy states, "...[contaminant] concentrations in the area of debris at Site 30 are sufficiently high that they present a potential risk to plants, benthic invertebrates, and aquatic birds as well as a significant risk to the salt marsh harvest mouse", but then goes on to state in both sections, "...remediation of the site must be based on a careful evaluation of risk assessment conclusions, uncertainty associated with those conclusions, and the ecological cost associated with attempting to remediate the situation." To reiterate what U.S. EPA staff have been saying for some time, U.S. EPA believes Site 30 is an appropriate site for the Navy to conduct a Non-Time Critical Removal Action to address human health risks and ecological risks to plants, aquatic invertebrates, birds, and small mammals, including the endangered salt marsh harvest mouse. The Navy had a removal action strategy for Site 30 several years ago, then changed to conducting an RI/FS, which is now taking years to complete. From a consistency standpoint, U.S. EPA notes that the Navy conducted a Time Critical

Removal Action at Site 31 (former fertilizer plant), in response to

much lower (terrestrial) ecological risks.

**Response:** 

The sentence "...remediation of the site must be based on a careful evaluation of risk assessment conclusions, uncertainty associated with those conclusions, and the ecological cost associated with attempting to remediate the situation." has been deleted in the draft final report. The Navy is agreeable to revising the approach to conduct a non-time critical removal action (non-TCRA) at Site 30 and plans to do so. However, the timing of the actual removal action will be dependent on available funding since future year budget targets have been set based on the traditional Comprehensive Environmental Response, Compensation and Liability Act process, including remedial investigation (RI), feasibility study (FS), proposed plan, record of decision (ROD), and remedial action.

3. Comment:

Also in the last paragraph on page ES-2, the Navy states, "[t]he Navy recommends Site 30 be moved forward to a feasibility study to evaluate remedial alternatives.", and in doing so suggests that remedial investigations and feasibility studies are independent, sequential processes, which is not the case. The need for the supplemental investigation that was requested by U.S. EPA and the State last year, reflected data gaps for conducting a FS, that is identified and scheduled in the Concord Site Management Plan. Alternatives that will need to be evaluated in either a FS or Non-Time Critical Removal Action Engineering Evaluation/Cost Analysis (EE/CA) and for which the data has been collected include; excavation/backfill, containment cap, soil stabilization, institutional controls, monitoring, and no-action.

**Response:** 

An RI is typically conducted to assess whether there is a need to take action to address a risk. Once a risk is established, alternatives to address the risk can be evaluated through an FS or through an engineering evaluation/cost analysis (EE/CA) for non-time-critical removal actions (non-TCRA). An FS need not necessarily follow or be part of a remedial investigation. Because the Navy now plans to pursue a non-TCRA, an EE/CA will be prepared. The removal alternatives to be identified and analyzed in the EE/CA are still to be determined, and for the sake of efficiency, the Navy intends to focus only on the most viable options. Waste removal (excavation/backfill) will certainly be among the alternatives assessed.

4. Comment:

Section 1.2.1, Site History: The Navy has (once again) forgotten to acknowledge the existence of a historical metal smelting operation that was situated on Seal Bluff immediately north of the Tidal Area Sites (1, 2, 9, and 11). The smelter operated prior to the Pacific Coast Shipbuilding Company at the same area.

**Response:** 

Section 1.2.1 has been revised to note that a metal smelting operation was located on Seal Bluff prior to the advent of the Pacific Coast Shipbuilding Company in the Tidal Area.

5. Comment:

U.S. EPA notes the list of metal contaminants detected at the site in soils and/or groundwater (arsenic, aluminum, cadmium, copper, lead, mercury, selenium, nickel, and zinc) appear to be similar to those detected in the Litigation Area and may indicate a connection of Site 30 with one or more of the Bay Point chemical companies responsible for historical contamination within the Litigation Area sites. The Navy should assess the possibility that past/current industrial operations in Bay Point may have used the Site 30 site for waste disposal.

**Response:** 

Although common contaminants as well as proximity suggest that nearby industrial operations may have used Site 30 for waste disposal, the debris characterization, aerial photographs, and other historical records are not adequate to identify the source or sources of the debris at this time. Given the lack of historical records, and the fact that the site has been well-characterized, the Navy intends to pursue addressing the waste even though the site's historical use may never be well established.

6. Comment:

Section 1.2.3, Hydrogeology: Text on page 4 indicates some tidal fluctuation has been in observed in the open water portion of Seal Creek Marsh which Site 30 extends into; "...water level at Site 30 fluctuate less than six inches during daily tidal cycles." While tidal fluctuation may be less than 6 inches, even small differences may impact water elevation measurements made on the newly installed monitoring wells. Please clarify if water elevation measurements made on the three wells were during a very close time interval or indicate if water elevations were measured at several times to verify if tidal variations were influencing water elevations in the wells.

**Response:** 

Section 3.1 has been revised to clarify that the water level measurements on the three new monitoring wells were all collected within a 10-minute interval.

7. Comment:

Figure 2, Location of Taylor Boulevard Bridge Disposal Site (Site 30): Please clarify if surface drainage culverts exist which connect Seal creek Marsh to Otter Sluice.

**Response:** 

No surface drainage culverts connect Seal Creek Marsh to Otter Sluice.

8. Comment:

Recommendations: Please clarify if the recommended additional assessment of arsenic in groundwater (in well GW01) will result in the Navy delaying transmittal of a Draft FS that is scheduled to be released on November 5, 2004, pursuant to the Concord Site Management Plan.

**Response:** 

The Navy does not propose any additional assessment of arsenic in groundwater. As reported in an e-mail communication from the Navy to the Agencies on May 13, 2004, the last sentence in Section 4.3 was in error and should <u>not</u> have been included in the document. It has been deleted in the draft final report. See responses to Comments 2 and 3 above with regard to the non-TCRA.

#### RESPONSES TO RWQCB GENERAL COMMENTS

1. Comment:

The Navy needs to refine their characterization of the site's hydrogeology. Hydrological and geochemical parameters such as: dissolved carbon, dissolved organic/inorganic carbon, total inorganic/organic carbon, dissolved oxygen, oxygen reduction potential, alkalinity, total suspended solids, temperature, conductivity, salinity, turbidity, chloride, nitrate as N, sulfate as SO2- 4, chloride pumping yield were not reported in this study (as recommended by Water Board Staff in a letter dated January 28th 2003). Furthermore, site specific geological characteristics such as hydraulic conductivity and porosity are missing from the report.

**Response:** 

Temperature, conductivity, dissolved oxygen, oxidation-reduction potential, turbidity, and pH are provided in Appendix D on the monitoring well sampling sheets. Total suspended solids and total organic carbon are provided in Table 3. Section 4.1 notes qualitatively that hydraulic conductivities in the subsurface are generally low. The Navy believes that these parameters provide a sufficient level of characterization to meet project goals.

2. Comment:

The Navy does not update the risk footprint map to endpoint receptors with lead concentrations detected in this study. Isoconcentrations contours with the EPA Region IX soil lead PRG (Preliminary Remedial Goal) of 400 mg/kg and the Cal-Mod lead soil PRG of 150 mg/kg could be drawn on updated maps. Furthermore, the Navy could use SADA (Spatial Analysis and Decision Assistance: <a href="http://www.tiem.utk.edu/~sada/">http://www.tiem.utk.edu/~sada/</a>) software to better delineate the probabilistically based extent of contamination in soils and groundwater at the site.

**Response:** 

All samples collected during this investigation were at locations within the original risk footprint. Therefore, the risk footprint was not updated. It is assumed that all sediment and debris within the risk footprint will eventually be addressed by a removal or remedial action.

3. Comment:

On July 3, 2003 Water Board Staff sent a letter requesting the Concord Naval Weapons Station a technical report evaluating the potential sources of emergent chemicals. Board Staff is recommending adding a section in the report identifying potential sources of emergent chemicals at the site and the rational for not sampling these analytes in the matrices characterized thereof.

**Response:** 

The site data and history do not suggest the presence of the emergent chemicals identified in the Board's letter of July 3, 2003. Therefore, no section has been included in the report.

4. Comment:

Provide an analysis of the influence of tidal fluxes to groundwater levels in monitoring wells. Furthermore, a map indicating salinity concentrations in soils/ sediments and water samples taken within the tidal influence zone should be provided.

**Response:** 

A tidal influence study has not been conducted and is not planned for this site.

Samples of soil, sediment, and water samples were not analyzed for salinity. However, an estimate of salinity for water samples can be derived from conductivity data, which were collected during the well purging process, and are provided on the monitoring well sampling sheets in Appendix D.

## RESPONSES TO RWQCB SPECIFIC COMMENTS

1. Comment: <u>Executive Summary, ES-1 and E-2</u>:

- 1. The Navy states that some metals were detected at concentrations above groundwater screening criteria (Ambient Water Quality Criteria, 1995 San Francisco Bay Basin Plan). The Navy needs to specify if they usually used the Ambient Water Quality criteria decreed for the protection of saltwater organisms (when available) due to the adjacent Seal Creek Marsh. The Navy does not necessarily apply the most stringent regulatory criteria to the metals detections found in groundwater. For example, USEPA (United States Environmental Protection Agency) recommends a concentration of 2.1 ppb for Arsenic as a drinking water reference dose (IRIS: Integrated Risk Information System), the Navy used 36 ppb. This is why it is essential that the Navy states if the groundwater at the site is potable per SWRCB resolution 88-63.
- 2. State what the groundwater velocity is at the site.
- 3. Place the sixth paragraph discussing contaminants exceedances in groundwater below the fourth paragraph.

- 4. Specify how arsenic might be naturally found in the area using soils and site specific geological data.
- 5. The last statement found in paragraph six is unclear. The relationship between elevated arsenic concentrations in groundwater and the hydrologic direction of recharge processes with surface water is vague. Clarify Section 4.1 on the same basis.
- 6. Please state that dioxins were detected in some of the sediment/soil samples taken at the site.
- 7. The Navy needs to acknowledge that one of the sediment sample (site 4) collected by the Water Board Staff in December 2001 had elevated Arsenic concentration (120 ppm).
- 8. The Navy needs to indicate how they concluded that a Feasibility Study is the appropriate next step to be taken at the site compared to the previously advanced option of a non-time critical soils/sediments removal.

### **Response:**

- 1. The executive summary has been revised to state that the data were screened using the most conservative of the marine or freshwater chronic values from the California Toxics Rule (EPA 2000), EPA national recommended water quality criteria (EPA 2002), and the basin plan water quality objectives for waters upstream of San Pablo Bay (RWQCB 1995). The Navy believes that that groundwater at the Tidal Area may be a suitable candidate for exemption from consideration as a potentially suitable municipal or domestic water supply on the basis of criteria (such as low well yields and high concentrations of total dissolved solids [TDS]) contained in State Water Resources Control Board (SWRCB) Resolution 88-63 and RWQCB Resolution 89-39. Most of the TDS levels at the site are estimated to be greater than 3,000 milligram per liter, using a standard conversion factor for the conductivity measurements (0.67 times the conductivity) taken at each well. Also, well yields in the shallow groundwater would be low due to the low hydraulic conductivity of the near surface geologic materials.
- 2. As stated in Section 4.1, hydraulic conductivities in the shallow subsurface are estimated to be low based on the soils encountered in the monitoring well borings. Therefore, groundwater velocities are expected to be low given the moderate hydraulic gradients at the site as shown on Figure 7.
- 3. The sixth paragraph discussing contaminants exceedances in groundwater has been moved to follow the fourth paragraph, as requested.

- 4. Section 4.1 of the text has been revised to state that the precise source of the arsenic in monitoring well GW01 is unknown; however is likely related to the debris. Existing data were not sufficient to conduct an evaluation of how arsenic might be naturally found in the area using soils and site-specific geological data.
- 5. Surface water transport could cause elevated arsenic concentrations in groundwater if groundwater near the debris was discharging to surface water and arsenic-containing surface water then recharged the groundwater near well GW01.
- 6. The executive summary has been revised to state that dioxin was detected in the one sediment sample that was analyzed for dioxins.
- 7. The executive summary and Section 1.2.4 has been revised to state that arsenic was detected at a concentration of 120 milligrams per kilogram (mg/kg) in a sediment sample collected at Site 4 by RWQCB staff in December 2001.
- 8. The Navy proposes to conduct a non-TCRA at Site 30. See responses to EPA Comments 2 and 3 above.
- 2. Comment:

Section 1.2.3, Hydrogeology, p 5: State the origins of the artificial fill partly composed of debris materials. Provide the approximate volume of the disposed artificial fill at the site using the obtained borehole data.

**Response:** 

As noted in Section 1.2.3, a description of the sediment and composition of the artificial fill, the relative thickness, and the distribution of each unit are described in Section 3.3.2 of the remedial investigation (Tetra Tech 2002). As noted in Section 1.2.1, the dates of debris disposal and the source of the debris at the site are unknown. An estimate of the volume of debris will be provided in the future EE/CA.

3. Comment:

<u>Section 1.2.4, Summary of Previous Investigations, p 8</u>: Provide the regulatory criteria used to screen metals in sediments and soils samples taken by Water Board Staff. Indicate that arsenic was found to exceed the EPA's PRG cancer risk endpoint of 29 ppm in soils/sediments.

**Response:** 

Section 1.2.4 has been revised to state that the results for metals in samples collected by the RWQCB were screened against freshwater continuous concentration criteria based on hardness from the U.S. Environmental Protection Agency (EPA) State California Water Quality Criteria (California Toxics Rule) (EPA 2000; RWQCB 1995), as noted in the analytical results table in Appendix H. Section 1.2.4 has also been revised to indicate that arsenic has been detected in soils and sediments at concentrations above EPA's PRG cancer risk endpoint of 29 parts per million (ppm).

## 4. Comment:

Section 2.1, Monitoring Well Installation and Development, p 9: The Navy needs to state why the wells were designed with 10 feet long screens. Board Staff is concerned that such lengthy well screen might consequentially, by its design, dilute groundwater contaminants in the samples taken. Furthermore, long well screens could distribute contaminants into un-impacted areas of the aquifer. Has the Navy considered the use of multichannel monitoring tubing discretely screened at specific short intervals? For example, it would have been most efficient screening the wells at locations where contamination of soil or sediments were detected the highest (as suggested in Water Board Staff letter dated January 28th, 2003). The Navy needs to provide an appendix describing the soil boring lithologies for the monitoring well points installed in this project.

## **Response:**

The use of 10-feet-long well screens is standard within the industry and complies with the 1995 California Environmental Protection Agency Monitoring Well Design and Construction for Hydrogeologic Characterization guidance manual (DTSC 1995). Ten-foot long well screens were used to expand the area available for well recharge, since the wells screened in the low conductivity formations such as those present at Site 31 typically do not recharge well. The Navy is not aware of RWQCB guidance which would indicate that well screens that are 10 feet long do not provide representative groundwater samples. The use of multichannel monitoring of discrete vertical intervals would be considered at a site where contaminants are suspected or known to be vertically stratified. An example of a site where multichannel monitoring would be used is where dense nonaqueous phase liquids (DNAPLs) are suspected or known to be present, which is not the case at Site 30.

Soil boring lithologies for the monitoring wells GW001, GW002, and GW003 are provided in Appendix C.

## 5. Comment:

Section 2.2.2, Groundwater Sample Laboratory Analyses, p 13: Provide the basis for not sampling TDS (Total Dissolved Solids) and monitoring well yields at the site. Indicate the rationale for only sampling one well for dioxin concentrations in groundwater.

## **Response:**

As stated in the response to RWQCB General Comment #1, the Navy believes that data on total dissolved solids and monitoring well yields are not necessary to meet project goals. As noted in the response to RWQCB Specific Comment #1, the Navy believes that groundwater at the Tidal Area may be a suitable candidate for exemption from consideration as a potentially suitable municipal or domestic water supply on the basis of SWRQCB Resolutions 88-63 and 89-39 criteria. Well yields are estimated to be low (less than 200 gallons per day), and TDS levels greater than 3,000 mg/L are estimated for most of the site wells.

Section 2.2.2 has been revised to state that only one groundwater sample was selected for analysis in the draft final Sampling and Analysis Plan (Tetra Tech, 2003) for dioxins because of several factors: (1) specific sources of dioxin such as incineration are not known to have occurred at Site 30; (2) the solubility of dioxin in water is very low; it thus tends to adhere to soil if released to land and is not likely to leach to groundwater (EPA 2004); and (3) dioxins are ubiquitous in the environment.

6. Comment:

Section 2.3, Debris Boring Completion and Sediment Sampling Procedures, p 13: State the value of characterizing contaminants extent and impact magnitude to groundwater and soils when the only borehole samples were taken below the debris horizon.

**Response:** 

The purpose of the 2003 Site 30 supplemental investigation was to (1) characterize groundwater quality, (2) assess the vertical extent of debris, and (3) characterize the concentrations of inorganic and organic chemicals present in sediment beneath the debris. Section 2.3 has been revised to state that the purpose of collecting samples below the debris was to assess whether contaminants are leaching from the debris to subsurface sediment.

7. Comment:

3.3.2.3, Polychlorinated Biphenyls, Pesticides, Semivolatile Organic Compounds, and Total Petroleum Hydrocarbon in sediment, p 21: State the significance of the TEQ (Toxic Equivalent Quotient) for dioxin. Provide an analysis of the dioxin impacts to toxicity for biota at the site comparing the TEQ to other sites and implemented response actions. Indicate the potential origin (disposal or atmospheric deposition) of dioxins at the site.

Response:

Section 3.3.2.3 has been revised to state the significance of the TEQ for dioxin and to indicate that no specific sources of dioxin, such as incineration, are known to have occurred at the site. The Navy believes that an analysis of potential impacts on receptors is not necessary for current project goals.

8. Comment:

Section 4.2, Conclusions Based on Sediment Data, p 24: Modify the year for which Water Board Staff sampled groundwater and soils/sediments at the site to 2001

**Response:** 

Section 4.2 has been modified to state that the Water Board staff sampled groundwater and soil sediments at the site in 2001.

9. Comment:

Appendix H: Previous Sampling Investigation Results (excerpted from the Draft Final Remedial Investigation Report): The table reporting Water Board collected samples results is incomplete. Indicate the matrix sampled and tabulate contaminants concentrations detected in samples taken from sediment/soils at the site.

**Response:** Appendix H has been revised to include a table reporting the results for

sediment samples collected by the Water Board in 2001. The sample

matrix is indicated in the title of each table.

### **RESPONSES TO DTSC GENERAL COMMENTS**

1. Comment: The Navy has selected a Feasibility Study (FS) as the next step in their

remediation strategy. The previous strategy for Site 30 was to conduct a non-time critical removal action. The rationale for the current course of action should be presented in the RI. This rationale should support the FS as the best alternative or it must be concluded that a non-time critical removal action would be more appropriate.

**Response:** Section 4.3 has been revised to state that the Navy now proposes to

conduct a non-TCRA at Site 30. Alternatives for the non-TCRA will be

evaluated in an EE/CA.

2. Comment: The loss of the tidal gate at Otter sluice has potentially impacted the

hydro geological conditions and tidal influences near Site 30. The Navy should determine if these potential impacts will affect their

conclusions with respect to Site 30.

With respect to the potential change in hydro geologic conditions and

the new well installations, the Navy should evaluate the need for

additional rounds of ground water sampling.

**Response:** The Navy intends to repair the tidal gate; therefore, no hydrogeological

impacts on Site 30 are expected.

3. Comment: The Navy needs to provide rationale for it's conclusion that arsenic is

naturally occurring.

**Response:** Section 4.1 of the text has been revised to state that the source of the

arsenic in monitoring well GW01 is unknown; however, is likely related to the debris. Existing data were not sufficient to conduct an evaluation of how arsenic might be naturally occurring in the area using soils and

site-specific geological data.

## **RESPONSES TO DTSC SPECIFIC COMMENTS**

1. Comment: <u>ES-1 and E-2</u>: Include in the summary that dioxin was detected.

**Response:** The Executive Summary has been revised to state that dioxin was

detected in the sediment sample that was analyzed for dioxins and that the toxicity equivalence quotient (TEQ) was calculated at 0.00114

micrograms per kilogram.

2. Comment: Section 2.1: Lithological data from the monitoring well installation

should be included.

**Response:** Soil boring lithologies for the monitoring wells GW001, GW002, and

GW003 are provided in Appendix C.

3. Comment: Section 3.3.2.3: The discussion regarding dioxin is vague with respect

to its' potential origin and toxicity for impacted species. An analysis

of impacts should be included.

**Response:** The Navy believes that an analysis of potential impacts of dioxin to

receptors is not necessary to achieve current project goals. Section 3.3.2.3 has been revised to state that there is no known specific source of dioxins, such as incineration, at Site 30. Appropriate screening criteria for dioxins

have not been identified.

#### REFERENCES

California Environmental Protection Agency, Department of Toxics Substances Control (DTSC). 1995. "Monitoring Well Design and Construction for Hydrogeological Characterization: Guidance Manual for Ground Water Investigations."

California Regional Water Quality Control Board (RWQCB). 1995. "San Francisco Bay Basin Plan." San Francisco Bay Region. June 21.

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- U.S. Environmental Protection Agency. (EPA). 2000. "Water Quality Standards: Establishment of Numeric Criteria for Priority Pollutants for the State of California. Final Rule." Office of Water. Washington, D.C. EPA-823-00-008. April.
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- EPA. 2004. "Consumer Factsheet on: DIOXIN (2,3,7,8-TCDD)" June 18. On-Line Address: http://www.epa.gov/safewater/contaminants/dw\_contamfs/dioxin.html